GAS JOURNAL

LIGHT ✦ HEAT ✦ POWER ✦ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXC. No. 3501.] LONDON, JUNE 25, 1930. [82ND YEAR. PRICE 1s.

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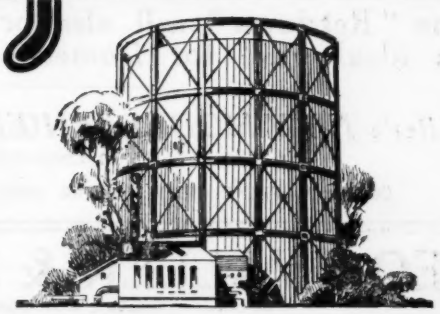

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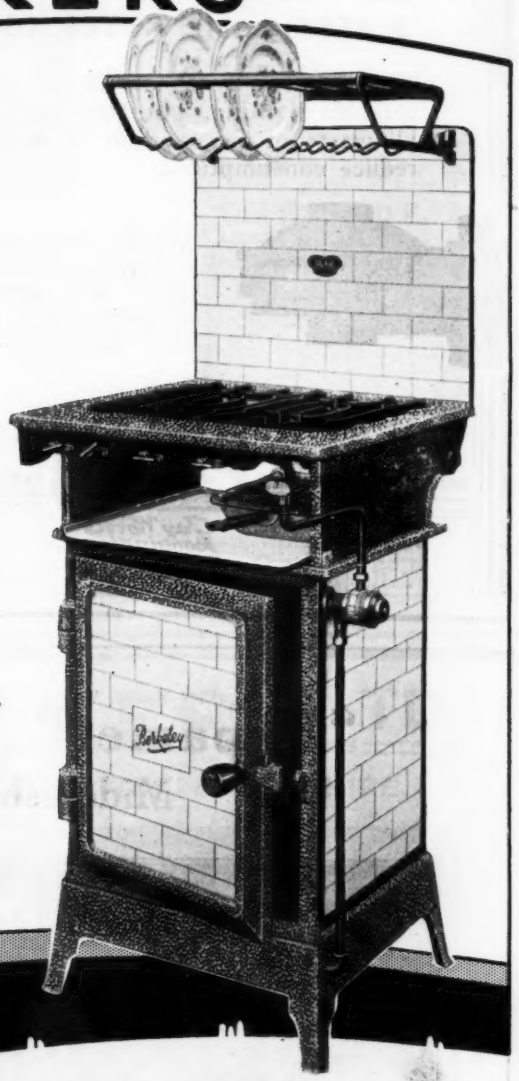

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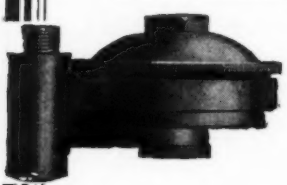

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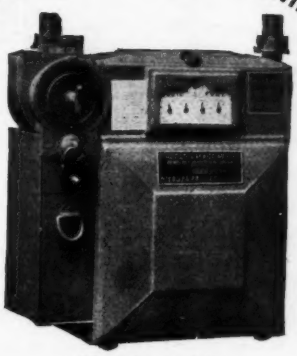

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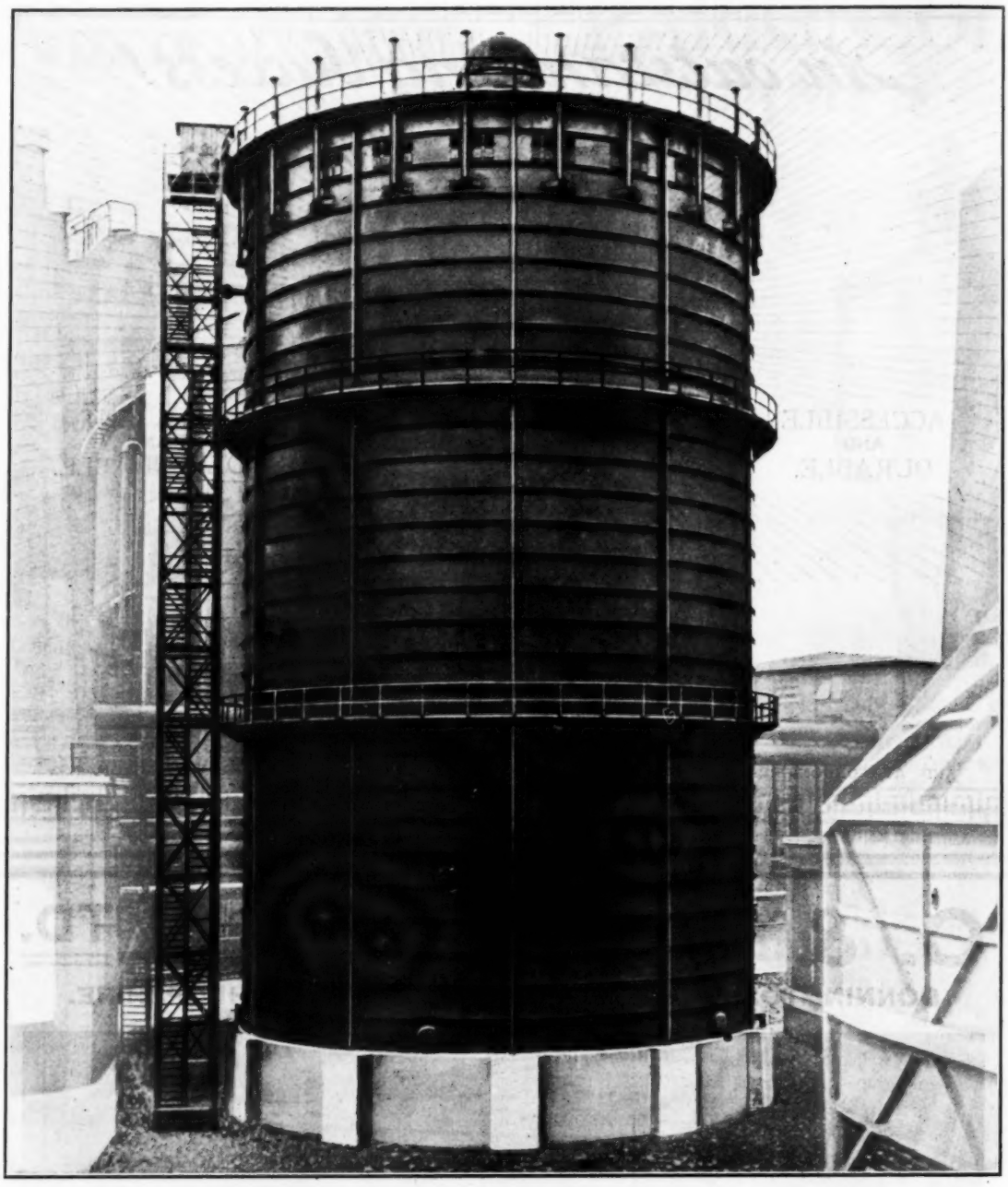

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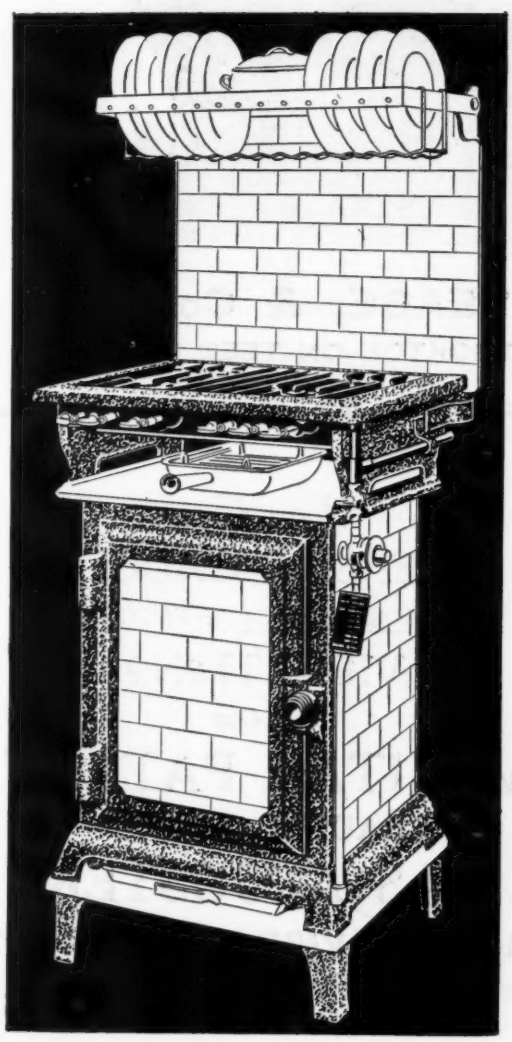

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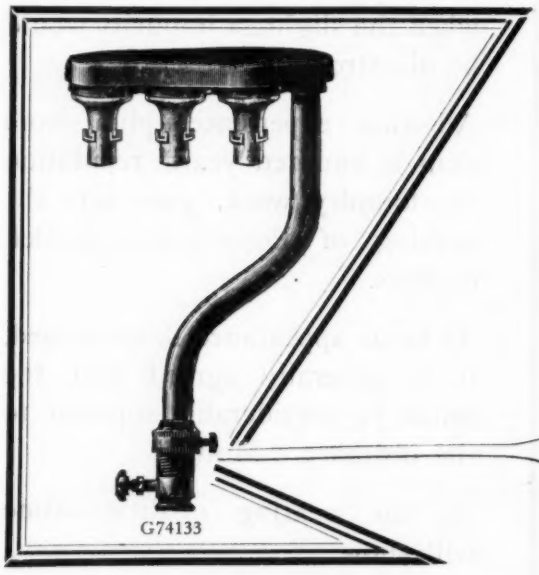

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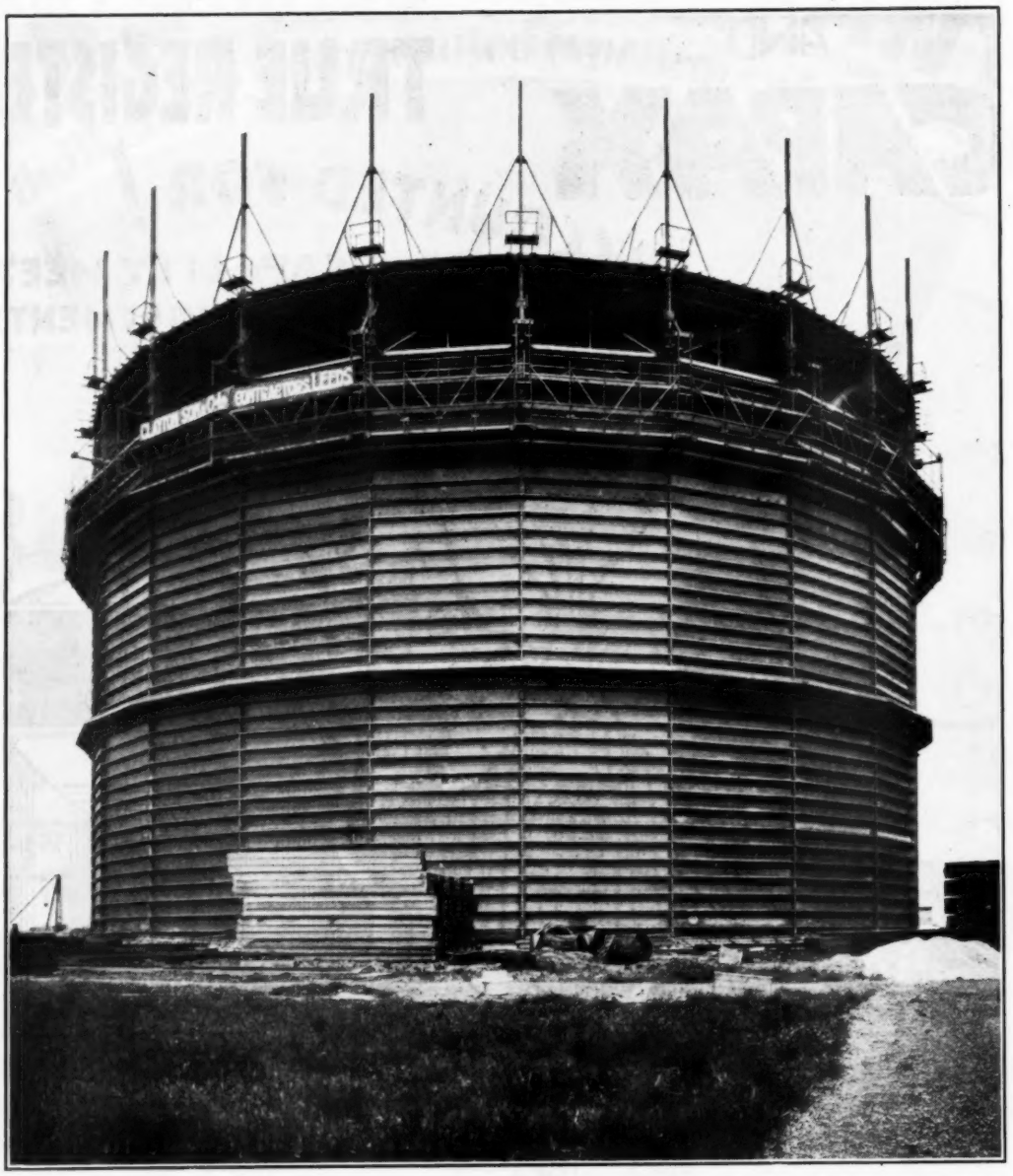

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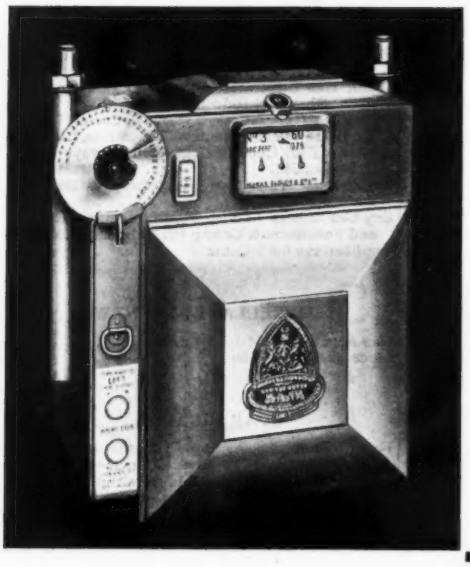

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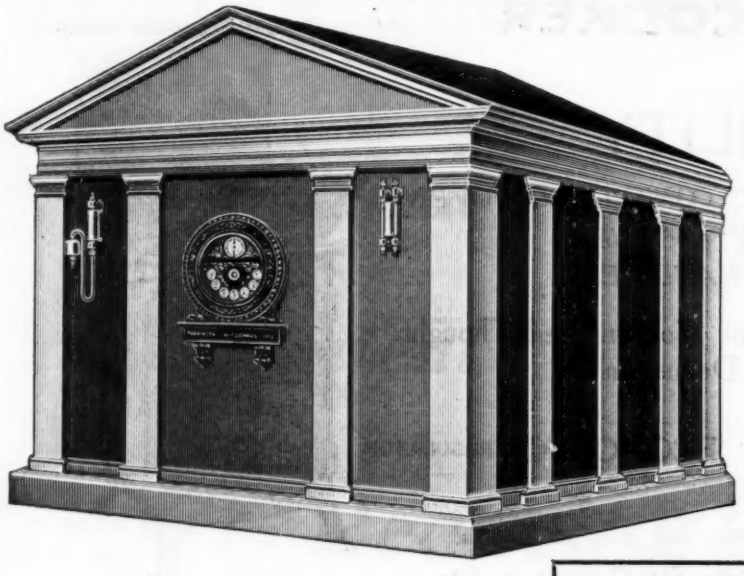

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VOL. CXC. No. 3501.] WEDNESDAY, JUNE 25, 1930. [82ND YEAR.

Editorial Notes.

From Southend to Windsor.

THOUGH there is a Biggar Gas Company, the Gas Light and Coke Company has for long been the biggest; and in a short time it will be bigger still. We are able to-day to make the announcement that an agreement has been reached to absorb the Southend-on-Sea and District Gas Company. In other words, when the terms of agreement become accomplished fact, the Gas Light and Coke Company will sell their gas between Southend Pier and Windsor, a distance, as the crow flies, of some seventy miles.

The recent history of the Gas Light and Coke Company has certainly been in keeping with modern trends of thought regarding big mergers; but this policy is really a continuation of a story which commenced in 1865, when a large amalgamation was entered into which had the effect of absorbing rival companies and of establishing an Act of Parliament which put an end to what was neither more nor less than a chaotic state. In that year the Imperial and Independent Gas Company, the Equitable Gas Company, and the Victoria Docks Gas Company were absorbed by the Gas Light and Coke Company. Then, in this respect, followed a period of quiescence, until, in 1910, the major Company of our industry absorbed the West Ham Gas Company. Subsequent amalgamations were with the Barking Gas Company, the Chigwell, Loughton, and Woodford Gas Company, the Ilford Gas Company, and the Brentford Gas Company. The last-named amalgamation took place in 1926; and it may be mentioned that the Brentford Gas Company was itself an amalgamation of no fewer than six erstwhile independent concerns. The addition of this Company doubled the area of that of the Gas Light and Coke Company; and until 1930 the latter Company was responsible for the supply of gas over an area of 265 sq. miles.

Then this year came the amalgamation of the Grays and Tilbury Gas Company, and of the Pinner Gas Company, Ltd., which increased the area of supply to 460 sq. miles, and the number of the population served to over four millions. In general, statistics are dull, but few would find that this generalization applied to the figures at present relating to the Gas Light and Coke Company, or which will apply in the near future. To date the Company has, for example, 4100 miles of mains, exclusive of service pipes to consumers' premises, of which no less than 250 miles were laid last year. Before long this mains-mileage figure will be increased by 154, and there will be a pleasant addition to the quantity of gas made annually, which at present stands at approximately 260 million therms. The undertaking is the largest, as it is the oldest, in the world.

The agreement with the Southend Gas Company—which will add 14 sq. miles to the present area of supply, and 37,000 to the number of consumers—will, of course, be the subject of a Bill to be submitted to Parliament. And if one allowed fantasy to enter into such a bald statement as this, one might imagine a recalcitrant therm, destined for an appliance on Southend pier, emerging after much journeying and many adventures at a consumer's house in the vicinity of Windsor Great Park. What a tale this therm would have to narrate! Had it hidden behind a speck of rust in a trunk main, to escape being swept along by its fellows? Has it any preference for being at the bottom or the top of a large waterless holder? But such fantasy is really beside the point. The main consideration is that the wonderful service, progressive ideas, efficient organization, wealth of technical knowledge, and unique privileges of training will be available to a vast tract of the most important area—we say this without offence—in Great Britain.

Correspondence Classes.

WE are glad that our suggestion that the question of correspondence classes in relation to the isolated student should be ventilated in the "JOURNAL" has met with the welcome which the importance of the problem merits. In our Correspondence Columns to-day several readers closely in touch with the Education Scheme of the Institution of Gas Engineers give their views, and they will be read with keen interest, for the subject is not one which can be shelved.

Emphasis is here directed to one or two of the views put forward by our correspondents. Mr. J. H. Brearley says that the more he considers Mr. Blundell's proposed correspondence course, the more convinced he becomes of its great potentialities. The main thing to guard against is that it in no way cuts across the aims and objects of the present Education Scheme—a point which we have always stressed. Also sharing our views, he remarks that postal tuition cannot be regarded as a substitute for class teaching. In regard to every potential student, however, "we cannot say 'let him remain in ignorance,' until every inducement has been made to get him on the track of knowledge, and that under the most carefully planned system, *because the industry needs the men.*"

A valuable contribution is that of Mr. T. H. Prater, Hon. Secretary of the Southern District Education Committee, who remarks that, if the control of correspondence tuition can be undertaken by the Gas Education Committee, it is difficult to see what drawbacks can possibly exist in such a course compared with class instruction at approved technical schools, which is dependent, no matter how carefully the course is compiled, on the teaching ability of the various teachers concerned.

We call attention also to Mr. B. J. Bell's insistence on

the desirability of preventing students from taking short cuts which eventually would be detrimental to themselves and might defeat the educational facilities already available, though Mr. Blundell's suggestion is, he observes, worth careful investigation. "If the idea could be advanced without interfering with the Scheme which has been so laboriously evolved, it would meet the requirements of the genuine isolated student." But, he says, is it not true that, if employers would grant facilities for students to attend at recognized centres of instruction, there would be very few cases of the genuine isolated student?

In brief, the "JOURNAL" to-day opens the door to a discussion which is bound to benefit the industry. Mr. Brearley states that "the greatest thing to fear is indifference within the industry itself." We hope that in this instance such fear will prove unfounded.

A Christchurch History of Naphthalene.

SEVERAL unusual features characterized the interesting paper by Mr. F. W. J. Belton, Engineer to the Christchurch Gas, Coal, and Coke Company, Ltd., before the annual meeting of the Gas Institute of New Zealand, and there are several lessons to be learnt from it. The author of the paper (which will be found on later pages of our issue to-day) tells us the story of how he tackled the naphthalene bogey in his area of supply, and how he overcame his difficulties—difficulties which, owing to the climate of New Zealand, are peculiar. It appears at first sight, perhaps, to be a straightforward statement of success; but this success was not achieved without a good deal of effort, and without encountering uncommon problems.

Now the gas of Christchurch in 1928, at the outlet of the ammonia washing plant, contained between 3 and 5 grains of naphthalene per 100 c.ft.—in other words, what may be regarded as a small quantity. But, at the latter end of the summer of 1928, in spite of this, all sorts of complaints arose in the district, and the position became serious. A Livesey washer was used for oil washing, and oil spraying was carried out at the outlet of the purifier and at the outlet of the station governors. Then a Holmes washer was put into operation, and at once the naphthalene entering the purifiers was reduced to 0·75 grain. The figure at the outlet remained temporarily almost unaltered. However, in due course, the naphthalene which was contained in the oxide and in other sections of the gas-works plant was absorbed, and district complaints dwindled to practically nothing.

Such is the story in brief, but it is punctuated by many interesting findings. One of the facts brought to light during the remedial period was that the method of testing for naphthalene by employing an apparatus taking a small continuous stream of gas gave results of little value, the reason being that the continuity of the sampler by no means synchronized with the gas output throughout the twenty-four hours. At Christchurch 75 p.ct. of the gas is sent out between 6 a.m. and 6 p.m. Moreover, in the summer, during the twelve daylight hours, the sun temperature may easily be 150° Fahr., and the gas leaves the holder at 80° to 90° Fahr. This means that, as the gas leaves the holder during day hours it might actually contain 18 to 20 grains of naphthalene for a portion of these hours, and yet, owing to the rapid cooling of the gas during the night, a fairly low 24-hour figure is obtained. An apparatus was therefore designed which allows of a much more rapid stream of gas being passed; and this modification is illustrated in our columns to-day.

Mr. Belton explains why, after installing new condensing plant, there was a fresh outbreak of district complaints. He emphasizes that all overhead purifiers must be adequately protected from the weather, and especially from prevailing cold winds. Another lesson to learn from his paper is that on all works where plant is overloaded, and the ordinary methods of purification are employed, where extensions are undertaken they should be from the condensers forward, towards the holders, and not from the purifiers backwards to the retort house. Incidentally, the author's observations on the desirability of keeping the temperature of the gas uniform in the holder are very much to the point. On the subject of painting gasholders, he mentions that there will often be a difference of 50° to 60° Fahr. between the temperatures of two sheets of iron exposed to the sun, one painted red or black, and the other painted with aluminium.

Gas Prices and the Small Concern.

On later pages will be found an article on "Gas Charges" by Mr. Alfred Thomas, of Wellington, in which the author regards the subject from the point of view of one responsible for the success of a small undertaking, and refers particularly to the question of the prepayment consumer. He recounts the experience of Mr. Porteous, of Ware, who for the past two years has had in operation a two-part tariff system for slot consumers—a system which works smoothly and profitably. There is more satisfaction now than when a fourpence-halfpenny rebate was handed to all and sundry. "Then, Mrs. Brown taking 5000 c.ft. per quarter got 1s. 11d. and Mrs. Jones taking 9000 got 3s. 5d., and Mrs. Jones thought she ought to have more. Now Mrs. Brown gets nothing, and Mrs. Jones gets 5s. 8d. Of course, the Mrs. Browns did make a little fuss at first, but changing the single-cased old-fashioned cookers for new double-cased models, and other items, placated the ladies, and many of them have increased their consumption, so that now they too enjoy the rebate."

Free Fixing of Appliances.

Mr. Thomas puts forward the suggestion that small undertakings ought to extend their service by providing appliances, fixed free, for those consumers who can afford to use them. For instance, he remarks, a consumer who takes more than the average quantity of gas would be entitled to a higher grade cooker than those in general use. We should be well advised, he thinks, to extend this idea "very discriminately," treating every consumer according to his merits, and if necessary providing a gas iron, wash-copper, and fire free. Mr. Thomas has worked out some very interesting figures in connection with the two-part tariff. They relate, of course, to his own undertaking. He finds that the service charge amounts to 35 p.ct. of the total, and the commodity charge to 65 p.ct.

From the Word Go.

The troubles and trials of the manager of the small gas undertakings were mentioned by Mr. J. Learmonth, Manager of the Masterton Corporation Gas Department, during the proceedings at the annual meeting of the New Zealand Institute. From the word "go" he is, to put it mildly, "up against it;" and the only method by which success can be achieved is to act boldly. The policy of "making things do" is most expensive, and what may appear to be risks must be taken. Among other matters, Mr. Learmonth referred to the subject of meters, in which respect he suggested that we are sometimes rather careless. Here are his ideas: "If the consumer is satisfied, we are inclined to take up the same attitude; if the consumer uses more gas than the average, we are inclined to let the meter remain with him, year after year, rather than offend him by taking it out to be tested. Since we installed an up-to-date plant for testing, I have taken out 400 of the oldest meters in the town, and found the average loss to be 11 p.ct. Can we afford this loss? Several of the meters were from 40 p.ct. to 25 p.ct. slow; about 24 out of the number were 3 p.ct. to 6 p.ct. fast, and quite a number would not register at 2 in. pressure. It is a serious matter for the small works if the meters are not correct."

Reading Newspapers in N.Z. Trains.

In his Presidential Address before the Gas Institute of New Zealand, Mr. L. Pickering, General Manager and Engineer to the Napier and Hastings Gas Company, Ltd., joyfully announced the decision of the New Zealand Government to use coal gas on the railways throughout New Zealand—a decision which was arrived at after exhaustive tests. No doubt the opinion of the "man in the train" was taken on the relative merits of gas and electricity as a means by which he is enabled to peruse not only the headlines but also the articles in his favourite evening paper.

Electricity, and Keeping Warm.

There are two hundred and fifty all-electric houses in Liverpool. The tenants hung up their hats, rubbed their hands, and were, we imagine, under the impression that each of these houses would be a box-like Paradise. Alas, time has proved that the anticipations were set too high, for we understand that practically all the tenants have forwarded to the Housing Committee of Liverpool a petition for either an increase in the electric equipment or the installation of a coal fire. It would seem now that, far from rubbing their hands with pleasure, they are rubbing them because they feel cold. We suggest that the best solution to the difficulty is to instal gas fires. We say this not without good reason, because, from the account of the circumstances in a recent issue of the "Liverpool Post," we learn that "with two or three exceptions all the electric houses have chimneys, though they are at present sealed up." As an industry we ought to make more use of the fact that the gas fire fulfils the dual function of heating and ventilating. Were gas fires installed in these houses of Liverpool, there would be no need for the following statement in the "Liverpool Post." "When a wet garment is placed before a coal fire most of the moisture goes up the chimney, whereas in the case of an electric fire the moisture hangs about the room and is afterwards condensed."

A "Maison du Gaz."

At the Annual Meeting of the French Gas Association, M. Flandin, Minister of Commerce and Industry in the French Government, inaugurated the *Maison du Gaz*—which M. Ellissen, President of the Union Syndicale de l'Industrie du Gaz en France, described as the working home of all the technical organizations connected with the French gas industry. The building will contain a library for the use of members, a service bureau, and a museum. It will also function as a centre of education; and in a few months' time advanced and less advanced courses will commence, in order to produce "*des gaziers complets.*" In their new building the French gas industry have certainly stolen a march upon us, and we can only hope—as, indeed, we have hoped so long—that the theoretical conception of a building suitable as headquarters for our own industry will be translated into fact.

Stripping for Benzole.

At the meeting of the French gas engineers referred to in the foregoing, M. Ellissen spoke of the suppleness and adaptability of the gas industry, and mentioned particularly the extraction of motor fuel from gas. M. Pineau, Director of the National Office of Liquid Fuels, applauded this, and patted himself on the back as being one of the promoters of the Debenzolage Law, thanks to which, he said, 82 p.ct. of the gas now being produced in France is stripped for benzole. This was also the subject of a paper by M. Brunschwieg, who observed that, whereas in 1923 the French production of benzole was only 23,000 tons, the corresponding figure for last year was 79,000 tons. In view of the recent paper by Messrs. Hoffert and Claxton at the meeting of the Institution of Gas Engineers in Leeds this month, this increase in French production of benzole is most interesting.

Who is for Algiers?

It was almost an event for the Institution of Gas Engineers to leave London and hold their meeting two hundred miles away from the Metropolis. It may be mentioned that next year the Société Technique du Gaz en France will hold their congress in Algiers. Will there, we wonder, be a paper on gas lighting in the Sahara? At any rate, there is going to be an eleven-day tour of the desert, costing 4000 frs. The congress will be held in Algiers, from April 13-18, at the joint invitation of MM. Labon et Cie and Le Syndicat des Producteurs et Distributeurs d'Energie Electrique. The cost of the return journey from Marseilles (first-class) is 1000 frs., and of the stay in Algiers from 700 to 900 frs. Several interesting excursions, in addition to the one mentioned, have been arranged; and owing to the unusual nature of the meeting, those who wish to be present should communicate with the Secretary of the French Gas Association before June 30.

B.I.F., 1931.

Next year the British Industries Fair will open in London and Birmingham as usual on the third Monday in February (the 16th), and will close on Friday, Feb. 27. In regard to the London Section, by the addition of two floors of the Empire Hall, Olympia, which were not available last February, the exhibiting area of the buildings is increased by 50,000 sq. ft. to a total of 300,000 sq. ft. The Fair in London will open and close half-an-hour earlier than in previous years. That is to say, the hours will be 9.30 a.m. to 7.30 p.m., and the public, instead of being admitted from 4 p.m. to 8 p.m., will be admitted only from 4.30 p.m. to 7.30 p.m. and from 1 p.m. to 7.30 p.m. on Saturday, Feb. 21.

Unemployment Grants.

In our editorial columns of the issue for May 21 last we commented on the general question of unemployment grants and the assessment thereof for income-tax purposes, with special reference to the recent Seaham Harbour Dock Company case. Our readers will therefore be interested to note the reply of the Chancellor of the Exchequer to a question asked in the House of Commons on Thursday last. This will be found in our "Parliamentary Intelligence." The terms adopted by Mr. Snowden in his answer do not, we fear, give any hope that the present Government will take steps to amend the income-tax legislation to remedy the position arising out of the success of the Inland Revenue in the case mentioned.

Obituary.

The death occurred on June 14, at the age of 51 years, of Mr. JOSEPH EDWARD EASTWOOD, Chief Accountant of the City of Leicester Gas Department. Mr. Eastwood was taken seriously ill on June 10, at Cromer, where he was celebrating his silver wedding. A devoted and loyal servant of the City Gas Department for nearly 34 years, Mr. Eastwood had shown remarkable initiative and administrative ability since being appointed to the position of Accountant in October, 1928, and had endeared himself to all by his unfailing tact and courtesy. Mr. Eastwood leaves a widow and two daughters.

Forthcoming Engagements.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

June 26.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, Westminster, S.W. 1, at 2.30.

June 27.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council meeting in the morning.

June 27.—WAVERLEY ASSOCIATION OF GAS MANAGERS.—Annual meeting in the Goold Hall, St. Andrew's Square, Edinburgh. Address by the President, Mr. David Vass.

June 28.—MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION. —Ladies' Day. Visit to Wallasey Gas and Water Works in the afternoon.

July 8.—NATIONAL GAS COUNCIL.—Meeting of Central Executive Board, 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.

July 3.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION. —Annual Summer Visit. Inspection of the East Greenwich Works of the South Metropolitan Gas Company.

July 11.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS. —Visit to Bolton Gas-Works and Lecture on "The Microscopical Examination of Coal in Relation to the Production of Gas and Coke," by Mr. James Lomax, A.L.S., F.G.S., M.I.M.E., Paleo-Botanist to the Fuel Research Board. The lecture will be illustrated by lantern slides and microscopical preparations.

Aug. 19 and 20.—IRISH ASSOCIATION OF GAS MANAGERS.—Meeting in Dublin.

Sept. 11.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting at Aberdeen.

Sept. 18.—WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.—General Meeting at Porthcawl.

Oct. 10.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Visit to the Manchester Corporation Gas-Works at Partington.

Oct. 27 to 29.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Meeting at Hull and Bridlington.

Commercial and Industrial.

Stock Market Report.

[For Stock and Share List, see later page.]

The three weeks' account on the Stock Exchange closed on Friday last; and though there were serious depreciations in many directions during the period, the final tone was brighter. It most sections there is a confident belief that, with the opening of the new account on Monday, a stronger tendency will become more widespread.

Business in the Gas Section was somewhat lighter than usual last week, and there were few changes in the quotations. Malta and Mediterranean £5 shares gained ½ to 6, and Newcastle consolidated 1½ to 72 on the local Exchange. Among the falls, those companies operating abroad were the chief sufferers. Imperial Continental lost 10 points to 350; Colonial £1 shares 2s. to 19s.; European £10 shares ½ to 12½; and Alliance and Dublin ordinary 1 to 94½.

As we have pointed out before, Gas Stocks and Shares have not suffered to any great extent in the general fall in prices, and this is a point to bear in mind for those requiring permanent investments. Two stocks which merit attention in this respect at the present time are the Brighton and Hove 5 p.ct. consolidated and the Tottenham ordinary. The former Company has distributed 6¾ p.ct. on this stock for the past two years, and the sales of gas have steadily increased. The yield on this rate at the present price (103½) is £6 10s. 5d. With regard to the Tottenham Company, recent dividends on the "B" consolidated stock have been £6 3s. 9d. for 1927, £6 11s. 3d. for 1928, and on the ordinary stock £6 12s. 6d. for 1929, so that on the basis of the latter distribution the yield on the current price (104) is £6 7s. 4d. The stock changed hands last year at 108.

Coal Markets.

The depression is unrelieved on all sides, and prospects for several months ahead are regarded as very bad. Prices generally have been reduced as far as ever possible, and, though some buyers might be interested in forward buying at current levels, these are so low that collieries do not as a rule care to contemplate selling. The present situation is being cited by those who have always maintained that "marketing schemes," such as the Coal Bill proposes, with quotas and output restrictions, will be no remedy for the coal trade's ills. They quite rightly point out that, in the present state of the market, collieries are already working shorter time and producing less coal than would have been the case had the schemes been in operation, and still there is no sign of any improvement.

Gas coal pits generally are very short of trade, this being in any case their slack season. In Durhams, Wear specials are round 15s. 9d. f.o.b., and bests quote 15s. 6d. Seconds and others are 13s. to 13s. 3d., and many working very short time. The Yorkshire export price for screened gas is 15s. 6d. to 16s. 6d., but there is little inquiry.

Gas makes are still the best section of the coke market, and the price remains round 21s. 6d.

Trade Notes.

Water-Cooled Condenser for Kendal.

Ashmore, Benson, Pease, & Co., Ltd., of Stockton-on-Tees, have received an order from the Kendal Corporation for a water-cooled gas condenser installation, capacity 1,000,000 c.ft. per diem, complete with the necessary valves and by-pass connections.

Complete Gasification Plant for Leslie.

Messrs. Tully, Sons, & Co., Ltd., of Newark-on-Trent, Notts., have received an order from the Leslie Gas Company, of Fife, to remodel their gas-works, and supply one of their latest type of mechanically-operated complete gasification plants, complete with steam boiler and dehydrated tar recovery.

Joseph Taylor (Saturators), Ltd.

Messrs. Joseph Taylor (Saturators), Ltd., of Bolton, have received orders for saturators during the course of this year from the following undertakings: The Boston Gaslight Company; the Broadstairs Gas Company; the Cork Consumers' Gas Company (with full accessories for a complete plant); the Marlborough Gas Company; Penrith Gas Department; the Selkirk Gaslight Company; and Uddingston Gas Department.

Contracts Open.

Coal, &c.

The Cowes Urban District Council invite tenders for the supply of gas coal. [See advert. on p. 892.]

The Gas Committee of the Haverhill Urban District Council invite tenders for the supply of gas coal. [See advert. on p. 892.]

The Gas Committee of the Borough of Newcastle-under-Lyme invite tenders for the supply of gas fuel. [See advert. on p. 892.]

Tar and Liquor.

The Gas Committee of the Loughborough Corporation invite tenders for the purchase of their surplus tar and ammoniacal liquor. [See advert. on p. 892.]

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *June* 23.

There is nothing of special interest to report in the tar products market. Current values are as under:

Pitch is 47s. 6d. per ton f.o.b.

Creosote, for export, is 6d. to 6¼d. per gallon f.o.b.

Pure toluole is 2s. 2d. to 2s. 3d.; 95/160 solvent naphtha, 1s. 5d. to 1s. 6d.; pure benzole, 1s. 10d. to 1s. 11d.; and pyridine bases, about 3s. 9d.—all per gallon at makers' works.

Tar Products in the Provinces.

June 23.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 46s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0¼d. Creosote, in bulk, North, liquid and salty, 3¼d. to 3¾d.; low gravity, 1¼d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 2s. 2d. June, 2s. to 2s. 1d. July/December. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *June* 21.

There is no change to report in market conditions during the week. Orders are scarce in most departments, and, with few exceptions, stocks are gradually increasing.

Pitch.—Inquiries for autumn shipment are slow, and value remains nominal at 47s. 6d. to 50s. per ton f.o.b. Glasgow. The home market is also quiet with value easy at about 47s. 6d. per ton f.o.r. works.

Tar.—The value remains firm at 3¼d. to 3⅝d. per gallon *ex* works in buyers' packages; but new business is scarce.

Creosote is unchanged. B.E.S.A. specification is 3¾d. to 4d. per gallon; low gravity, 3s. to 3¼d. per gallon; neutral oil, 3d. to 3¼d. per gallon—all *ex* makers' works in bulk.

Cresylic is in poor demand, and values are lower at 1s. 8½d. to 1s. 9½d. per gallon for pale 97/99 p.ct., 1s. 7d. to 1s. 8d. per gallon for dark 97/99 p.ct., and 1s. 11d. to 2s. per gallon for pale 99/100 p.ct., all free on rails makers' works.

Crude Naphtha.—Quotations are in the region of 4¼d. to 4⅜d. per gallon *ex* works.

Solvent Naphtha.—90/160 grade is steady at 1s. 2½d. to 1s. 3½d. per gallon, and 90/190 is easy at 1s. to 1s. 1d. per gallon.

Motor Benzole.—There is a fair demand, and value is steady at 1s. 6¼d. to 1s. 6⅜d. per gallon f.o.r. works.

Pyridines are unchanged. 90/160 grade is valued at about 3s. to 3s. 3d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole . . .	0 10	to 0 11	per gallon at works
Motor ,, . . .	1 5⅜	,, 1 6⅜	,, ,,
Pure ,, . . .	1 10	,, 1 11	,, ,,

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Stoke-on-Trent Corporation.

To extend the limits of supply, and to enable the Corporation to purchase scheduled land and to borrow further money.

SECTION 1.

Yeadon and Guiseley Gas Company.

To authorize the Company to borrow on mortgage of their undertaking, or by the creation and issue of debenture stock, any amount not exceeding the aggregate amount of the paid-up share capital of the Company for the time being and of any premiums paid in respect thereof.

Titchfield District Gas Company.

To empower the Company to borrow up to the aggregate amount of the paid-up capital.

DECLARATION OF CALORIFIC VALUE.

Seaham Gas and Lighting Company.—500 B.Th.U. (Sept. 18.)

In To-Day's "Journal."

New Books.

The following are among the books reviewed in our columns to-day: "Modern Gas Fitting in Theory and Practice," by S. T. Phillips and G. T. Tutt; "Compulsory Taking of Land," by Thomas Waghorn, revised by R. Borregaard (Third Edition); "The Year Book of the Coke Oven Managers' Association, 1930."

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London Juniors at Eastbourne.

Last Saturday marked the occasion of the annual summer outing and ladies' day of the London and Southern District Junior Gas Association, and this year members and lady friends were the guests of the Eastbourne Gas Company in a tour of inspection of the works and at the subsequent luncheon at the Angles Hotel.

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A Visit to Messrs. Sugg's Works.

On Thursday, June 19, under the Presidency of Mr. S. B. Chandler, Distribution Superintendent to the Tottenham and District Gas Company, the Southgate Chamber of Commerce paid a visit of inspection to Messrs. William Sugg & Co.'s Ranelagh Works, Westminster, and were afterwards entertained at tea by the Company.

* * * *

Naphthalene Extraction by Oil Washing.

The word naphthalene can scarcely be mentioned without conjuring up visions of all sorts of troubles, says Mr. W. J. Belton, Engineer to the Christchurch Gas, Coal, and Coke Company, in a paper before the Gas Institute of New Zealand. He goes on to tell of his own naphthalene troubles and their subsequent remedy by oil washing processes. In conclusion, Mr. Belton outlines a new method for the determination of naphthalene in gas.

"The Functions of Coke Ovens."

Mr. H. J. Hodsman, of Leeds University, contributes in writing to the discussion on Mr. E. G. Stewart's paper on "The Functions of Coke Ovens" before the Institution of Gas Engineers at their annual meeting in Leeds this month.

* * * *

Meter Inspectors at Pound Lane.

The Association of Statutory Gas Meter Inspectors were entertained at luncheon by the Gas Light and Coke Company at their Pound Lane (Willesden) Meter Works on June 18. The Association, under the Chairmanship of Mr. H. N. Barrow, were officially welcomed on behalf of the Company by Sir Francis Goodenough, C.B.E., and Mr. E. C. Holt, Manager of the Pound Lane Works.

* * * *

The Rationalization of the Gas Industry.

In his third article on this subject, Mr. George Evetts deals to-day with the purchasing of gas in bulk from neighbouring gas companies or coke ovens and with purchase of gas from a grid. He draws attention to methods of price fixing, and to adequate compensation for displaced officers. Mr. Evetts also discusses the recently published report of the Area Gas Supply Committee, and comments upon various important questions therein.

* * * *

Gas Charges.

In view of the interest taken at their last meeting in a discussion of differential prices for gas, and in accordance with a request that a paper should be read on the subject, Mr. A. Thomas, of Wellington, submitted some particulars as a basis for consideration and discussion before the Western District of the Southern Association of Gas Engineers and Managers. At the outset the author deals with the well-known tariffs introduced by Mr. McLusky at Halifax, and goes on to point to ways in which gas charges may be made more attractive.

Correspondence.

[We are not responsible for opinions expressed by Correspondents.]

The "Glycerin" Process.

SIR,—I am interested to note the statements made by Mr. Cooper in your issue of June 11 relative to the use of glycerin as a dehydrating agent; and in reply to the varied questions he asks, I have pleasure in making the following statements with regard to this plant which has now been in operation over two years, on our holder outlet.

The gas-drying plant put down by Messrs. Kirkham, Hulett, & Chandler, Ltd., has in every way fulfilled all our expectations, and, apart from one or two minor alterations which are generally associated with the installation of a new process of this type, has caused no trouble to operate. Since the plant has been installed, the effects of dehydration have been most noticeable throughout my district; there is not the slightest sign of water in any of our syphons, and more noticeable still is the fact that during the heavy frost period of the last winter but one, not a single one of our services was frozen. There has also been a very considerable decrease in our general complaints.

I am making these statements with regard to the satisfactory working of the plant, because the results obtained amply justify it. Although I am not desirous of entering into a prolonged Press correspondence on the subject, I am perfectly willing to throw my works open to any gas engineer or member of his technical staff to come and investigate the matter for himself.

I take Mr. Cooper's good faith that the figures he quotes for the latent heat of the absorbed water are correct, but surely also the question is equally applicable in the case of calcium chloride. As a matter of fact in our glycerin plant, the bulk of glycerin is so small that the major portion of the heat is dissipated. The maximum temperature rise of the gas through the plant being approximately 4° Fahr., whereas in Mr. Cooper's figures this difference is given as 15° Fahr. (viz., from 60° Fahr. to 75° Fahr.), and this may be the main cause of the discrepancy in his figures. If this heat effect was present, it would be a comparatively simple matter to pass the cooling water to the vacuum pump, through a series of tubes embodied in the washer.

I am not proposing to enter into a long technical correspondence on the merits and demerits of these two respective processes, and merely wish to confirm the facts we have experienced at these works, which prove beyond doubt that crude glycerin is a suitable medium for the purpose of gas dehydration. From the results and the knowledge we have gained in regard to this subject since we first installed this process, I have not the slightest hesitation in saying that if I had again to put down a further dehydration plant, I should do exactly the same thing.

JAMES SMITH.

Gas Engineer's Office,
Colwyn Bay,
June 17, 1930.

Correspondence Classes.

SIR,—Mr. J. E. Blundell earns the thanks of the whole industry for bringing new light to the question of educating its young recruits, and for putting his points so clearly and convincingly.

Only the superficial observer of the industry's needs to-day can be indifferent to any suggestion which has within it the germs of improvement in its personnel; Mr. Blundell gives that promise—and so forcefully that it cannot be summarily "turned down." It simply must be turned "round and round" to see whether it has any weak points. As one actively associated in past years with education as applied to the gas profession, and still retaining interest in that movement, I have scrutinized Mr. Blundell's proposed correspondence course; and the more I consider it, the more I am convinced it has great potentialities. The main thing to guard against is that it in no way cuts across the aims and objects of the present Education Scheme; the greatest thing to fear is indifference within the industry itself.

Times change, and we with time. It will become increasingly difficult to get men to attend classes for theoretical instruction who have already to devote from 44 to 50 hours (or more) per week to their vocational work. There are so many allurements to-day which did not exist even twenty years ago—just at the hours at which technical classes are commonly held. However much we may regret it, this is a fact which has to be faced. As I see the correspondence course which Mr. Blundell has in mind, it will not only go a long way to meeting the case

of the isolated student, but will help to draw in the student who, though not isolated from technical classes, chafes at having both his evening and his daytime hours appropriated to a time-table decreed by his industry. He needs not only some recreation, but social intercourse or elevating pursuits (apart from gas); and these are most readily available (say) between 7 and 10 p.m.

Correspondence classes would, I think, appeal to this type, for he would see in them a means of developing his vocational aspirations which did not too forcibly intrude upon his other pursuits. Recollections of my own youthful "swotting" when others were peacefully reposing in bed tell me that being able to fix one's own "class hours" has a charm all its own. Work or study done of one's own volition is less irksome than shepherded work or study. Correspondence classes meet this requirement; the student fixes his own hours of study; there is only one simple regulation, to complete each section of study or task imposed by the postal tutors within the period mutually agreed.

How the matter appeals to the student is dealt with at this length because it is first necessary to see his point of view—that of the average individual (20, 30, or 40 years old) with no opportunity or means of taking a university course. The student who would neglect his postal course would do little credit to class study. At the same time, postal tuition cannot be regarded as a substitute for class teaching so much as an alternative to be used by those who cannot attend a class or, for diverse reasons, are reluctant to do so. We cannot say "Let him remain in ignorance," until every inducement has been made to get him on the track of knowledge, and that under the most carefully-planned system, *because the industry needs the men.*

In 1912 I read before the Institution a paper entitled "Some Notes on the Examinations in Gas Supply," based on my experience as Examiner over the years 1908-1911 inclusive. In that period there came before me for adjudication 1246 papers—viz.: 1908, 193; 1909, 315; 1910, 310; 1911, 428. These and other particulars appear in the Transactions for 1912. It may be recalled that these were the first four years of a separate course in Gas Supply, the only examination hitherto devoted to the gas industry being the City and Guilds course in Gas Manufacture. I recall with unalloyed gratification that when I advocated a separate course in Gas Supply, the then Council of the Institution took it up enthusiastically, and the "innovation" met with signal success.

Now let us consider what has happened since. The problems besetting the industry have increased out of all recognition with those prevailing in 1912. Developments on the Supply side have been enormous, and competition has grown apace. Yet, from the Report of the Gas Education Committee submitted at Leeds we find that the total number of candidates presenting themselves in Gas Supply was only 152 in the Major Courses.

Since 1912 the courses in Gas Fitting were inaugurated, chiefly through the pertinaceous advocacy of the late Mr. Henry Kendrick. This year there sat in Gas Fitting 480 candidates, which brings up the total number on the Supply side to 792. When these are set beside the 428 in 1912, can they be regarded as satisfactory? That they cannot be is shown by the Gas Education Committee's own words in this year's Report (referring to Gas Supply only), "It is a figure far below what might reasonably be expected from the large number of men on this side of the industry."

Let it be clearly understood that I am dealing solely with figures, and not with the character of the examinations, which have properly been the subject of repetitive modification and "stiffening" to meet the more exacting needs as the years have passed. The fact should sink home that on the Supply side (excluding Gas Fitting) *there are 25 p.ct. fewer candidates than in* 1911.

From 1914 to 1918 came the Great War. This not only changed the map of Europe, but it changed the moods of its people, and not least of the rising generation. The influence of this upon gas examinations is a factor which cannot be enlarged upon here, but it must be noted when considering the "mystery" of why so few young men "roll up" for technical college courses in gas and the inevitable terminal examinations.

J. H. BREARLEY.

June 19, 1930.

SIR,—Since the Education Scheme was launched in 1923 there has been considerable discussion upon its effect and the difficulties in working to the conditions.

One hesitates to add to the voluminous contributions which have been made, particularly in view of the revision of the original scheme. Once more, however, prominence has been given to the isolated student, who has been the controversial pivot ever since education became a practical question in the industry. It is well to remember that after a very short experience of the working of the Scheme this difficulty became evident, and the attention of the Education Committee was drawn to these drawbacks at a very early stage.

The student who was willing to attend a recognized centre, but found it physically impossible to do so, was a very real problem until the Board of Education's representatives on the Institution Education Committee came to the rescue, and assisted in devising the provisions of the Revised Scheme. So far as ancillary subjects are concerned, the Committee certainly achieved a creditable solution.

It must be admitted that the Education Committee, with the hearty co-operation of the Board's representatives, have evolved a Scheme which should meet the requirements of nearly every student.

The standard of ancillary subjects is clearly defined; the attainment of that standard is left to the student. Furthermore, certificates of specified examining bodies are accepted by the Board of Education as evidence that the desired standard has been attained.

Now the problem of the isolated student was not confined solely to specialized knowledge of gas engineering and gas distribution, but necessarily included the real basis of general education in the ancillary subjects. The freedom now permitted overcomes all the previous objections, and no student is debarred by geographical conditions from qualifying in ancillary subjects.

It is generally agreed that oral tuition is far more effective than correspondence courses, particularly when classes are taught by trained educationalists. For this reason the Board of Education have provided special courses to train teachers who are not professionals to teach instead of merely lecturing. This briefly shows that every aspect of the problem of education has been explored, and the difficulties removed under the Revised Scheme.

The new thought that has been added is the desire to make the Institution of Gas Engineers, through their Education Committee, an educational authority, whereas, up to the present, it is an examining body only.

It does not seem advisable that the Institution should act in the dual capacity, particularly as there are facilities for obtaining instruction at present. It would be an achievement if Leeds University inaugurated such a scheme so long as it did not interfere with the possibilities of the approved centres obtaining sufficient students to maintain the classes. The great danger appears to lie in the fact that this would develop into single subject correspondence courses. The supreme difficulty in the past has been the lack of training in ancillary subjects. These take far more time to prepare to the standard than the single course subject, and are really the crux of the situation.

So far as the student who is too old to attend classes in a recognized centre is concerned, it is very unlikely that such a man would be willing to take the five years' course in ancillary subjects either by correspondence or by any other means; and it appears that the work of the Education Committee would again resolve itself into a selection of exemptions. It is seven years since the inception of the Scheme, and the time is surely arriving when the age plea may be eliminated.

The main point in this communication is to emphasize the desirability of preventing students from taking short cuts which eventually would be detrimental to themselves and defeat the educational facilities already provided. A genuine case of isolation would undoubtedly receive sympathetic consideration of the Education Committee.

Mr. J. E. Blundell's suggestion is worth careful investigation. If the idea could be advanced without interfering with the Scheme which has been so laboriously evolved, it would meet the requirements of a genuine isolated student.

There is an aspect however which appears to be constantly overlooked. Is it not true to say that, if employers would grant facilities for students to attend at the recognized centre for instruction, there will be very few cases of genuine isolated students? The number of such centres has been materially increased, and accessibility has been carefully considered.

Gas authorities imbued with the spirit expressed by Mr. Blundell will not hesitate to assist in this way; and it certainly seems that the true solution of improving the standard lies more in the direction of removing from the individual student such difficulties as may exist, rather than involving the Education Scheme in having to embody further exemptions in its provisions.

B. J. BELL.

Cardiff Gas Light and Coke Company,
June 23, 1930.

SIR,—It is now nearly two years since the Gas Representatives on the Southern District (Eastern Area) Gas Education Committee, conscious of their inability to carry out successfully the duties required of them, submitted a report pointing out a way in which the difficulties of the isolated student could be removed.

The recent remarks at the Institution Meeting on the possibilities of correspondence tuition in gas matters, having behind it the authority and control of the Chartered Institution of Gas Engineers, call to mind certain portions of that report—viz.:

> "... It is obvious that, if we wish to give equal tuition facilities without undue hardships to all potential students, we must openly acknowledge all ways and means by which such tuition can be obtained. This will, of course, include

tuition by correspondence; and, in view of the fact that tuition by this method is already allowed in the main theme of the examinations—*i.e.*, Gas Engineering or Gas Supply—we suggest that tuition by correspondence is just as satisfactory as the present methods, and is, in fact, the only means available for many students.

". . . If the full benefit of education is to reflect itself in the future efficiency of the gas industry as a whole, the means of education and incentives for study must be placed before the students to be found in the smaller works. It is in these works that the biggest advances in efficiency can be made.

". . . It was also considered desirable that the Institution should itself set examination papers in the ancillary subjects."

To a very large extent the present regulations satisfy the suggestions made in that report.

It is interesting to reflect that proposals were made in our Committee when drawing up this report that the Institution, having partly recognized tuition by correspondence, should undertake the control of that tuition. This proposal was unanimously approved, but was not included in the report at the time, as it was considered to be too revolutionary a suggestion, and one which might seriously reduce the chances of our report being taken as embodying practical propositions.

While the Institution is so very carefully examining the courses of tuition at different technical centres, and even calling for considerable alteration before including them in their list of approved schools, it certainly seems inconsistent to allow tuition by correspondence to be gained in the main themes of Gas Engineering and Gas Supply, and now in the ancillary subjects also, from sources entirely outside the control of the Gas Education Committee.

If the control of correspondence tuition can be undertaken by the Gas Education Committee, it is difficult to see what drawbacks can possibly exist in such a course compared with class instruction at approved technical schools, which is dependent, no matter how carefully the course is compiled, on the teaching ability of the various teachers concerned.

It has not been possible since the Institution Meeting to call a meeting of my Committee to deal with this new suggestion of correspondence tuition, but I am sure that considerable support will be forthcoming; and I hope that the pages of the "GAS JOURNAL" will air the views of the profession in general.

T. H. PRATER,
Hon. Sec.,
Southern District Education Committee.

Gas-Works, Margate,
June 23, 1930.

SIR,—I am very keenly interested in the comments and suggestions of Mr. J. E. Blundell on the provision of facilities for isolated students by correspondence.

The Gas College was founded in 1924 with the object of meeting this need. The proposal to found the College was brought to the notice of the Gas Education Committee of that time, and I had the privilege of discussing the matter with them. Quite reasonably the Committee felt that they could not advise the official recognition of an essentially experimental institution.

The experimental stage has passed, and the progress made may be assessed from the following:

"Gas College" Successes in the Examinations of the Chartered Institution.

Year.	Gas Engineering.			Gas Supply.		Totals.	Total Awarded	P.Ct. Gained by "G.C." Students.
	Diploma.	Higher.	Ordinary.	Higher.	Ordinary.			
1926.	No candidates submitted	5	6	2	9	22	45	42
1927.	2—2nd class	11	15	1	9	38	69	55
1928.	3—1sts, 1—2nd	10	10	2	16	42	81	52
1929.	3—1sts, 1—2nd	10	16	1	19	50	81	62

Total number of First-Class Certificates, 78. Total number of Second-Class Certificates, 74. 152 External Certificates out of 276 awarded to the whole industry during the four years 1926-29. These successes represent 89 p.ct. of the total number of candidates submitted by the "College."

The Regulations (1929) of the Institution which make it practicable for us to arrange facilities in the ancillary subjects as well as in the main subjects of Gas Engineering and Gas Supply were not available until approximately four weeks after our usual date for the commencement of winter classes. This late start created many difficulties, but we immediately increased our staff, and we succeeded in providing facilities for the winter. These will be perfected before August, and be up to the standard of "approved" technical schools.

We claim that the standards of our courses in Gas Engineering and Gas Supply are higher than any yet achieved, and we invite inspection by anyone sufficiently interested to pay us a visit.

The Gas College is the only institution catering solely for candidates for the gas profession. Mr. Blundell suggests that a correspondence college (with university standards) should be run with the approval, and/or the assistance, of the Institution of Gas Engineers, in connection with the Fuels Department of Leeds University. I would welcome the appointment of a small Council or Board by the Institution for this purpose, and I am willing that the work of the Gas College shall be subject to a reasonable control by them.

ARTHUR COE,
Principal and Founder.

The Gas College,
3, Thrum Hall Lane, Halifax,
June 19, 1930.

How Electricity is "Sold" at Hastings.

SIR,—There is a curious slip in the last line of the letterpress in connection with the electricity chart on p. 825 of the "JOURNAL," for which I am afraid I must be responsible. The word "low" should be "high." Obviously it should read "the load factor has been as *high* as 25·73." The point is, of course, that it has fallen from this high figure. If the new tariff paid strict regard to the load factor principles *per se*, one would expect the load factor to have risen, not fallen. It might mislead some of your readers; and you may therefore think it wise to call attention to the error. Please accept my apologies for the mistake.

CHAS. F. BOTLEY,
Engineer and General Manager.

Hastings and St. Leonards Gas Company,
June 19, 1930.

Coalite Redivivus.

SIR,—The letter from Mr. J. H. Brearley in your last issue is of the schoolboy debating order, and rather contemptible.

I do not propose to be dragged into a prolonged discussion on these terms, further than to say that I regard his reference to the late Prof. Reid and to the letter of prominent citizens of Manchester in particular, as peculiarly offensive.

As an offset to Uriah Heap in Mr. Brearley's first contribution I would offer in exchange Pecksniff, some of whose characteristics would seem to fit him admirably.

ANDREW STILL.

The "Investors' Review,"
30, Fleet Street, London, E.C. 4,
June 23, 1930.

A Panel of Translators.

SIR,—I venture to bring to your notice a project which is likely to be of interest to your readers—the formation by the Association of Special Libraries and Information Bureaux of a Panel of expert translators.

Those who require the services of a translator often experience difficulty in finding one who has a knowledge both of the language and also of the special subject concerned; and the difficulty increases where the language is uncommon and the subject highly technical. Proficiency in the language is not enough. To afford specialized service the translator must have not only a good knowledge of the language, but a really close acquaintance with the subject he has to translate—*e.g.*, the law, metallurgy, medicine, architecture, management, or whatever the subject may be.

With the object of overcoming this difficulty, which has been brought to their notice continually, the Council of the Association recently appointed a Committee consisting of Dr. S. C. Bradford, Librarian, The Science Library; Allan Gomme, Librarian, The Patent Office; Dr. R. S. Hutton, Director, British Non-Ferrous Metals Research Association; Miss A. L. Lawrence, M.B.E., M.A., LL.B., Intelligence Officer, British Medical Association; Brig.-General Magnus Mowat, C.B.E., M.Inst.C.E., M.I.Mech.E., Secretary, Institution of Mechanical Engineers; and E. I. Robson, M.A., Librarian, Institute of Agricultural Engineering, to prepare a scheme for establishing a Panel of translators having both linguistic and technical qualifications, the part taken by the Association being to act as a connecting link between the translator and the user. Names of approved qualified persons are now being registered under the scheme adopted, and those who are interested, in either capacity, are invited to write for particulars to the Secretary, Association of Special Libraries and Information Bureaux, 26, Bedford Square, London, W.C. 1.

While the Panel is intended to consist primarily of approved individual translators, it is hoped that commercial translating bureaux, which may partly or wholly function in the field of specialized subjects, will apply for registration if they are prepared to satisfy the Association of their ability to offer such high-grade service.

J. J. THOMSON,
President.

Association of Special Libraries and Information Bureaux,
26, Bedford Square, London, W.C. 1,
June 16, 1930.

Topical Items.

Dutch Pitch Production.—The production of pitch in Holland in 1928 totalled approximately 35,000 tons, and increased in 1929 to approximately 45,000 tons, owing to the great extensions to the coke plants of the Netherland State Coal Mines. The greater share of the output is sold on the domestic market for the manufacture of briquettes, and the remainder is exported chiefly to Belgium and France.

Tenants of the Plympton Rural District Council have received a letter from the Clerk intimating that they must not use gas for lighting purposes, and that any breach of this instruction will result in notice to quit being given. The gas supply is provided by the Plymouth and Stonehouse Gas Company, and the Rural District Council recently set up its own electricity department, taking current in bulk from the Plymouth Corporation.

Wales and Monmouthshire Juniors to Visit Greenwich.—The summer visit of the Wales and Monmouthshire Junior Gas Association will take place on Thursday, July 3, and, at the invitation of the South Metropolitan Gas Company, members are to have the opportunity of inspecting the Company's largest gas-works at East Greenwich. An excursion train will leave Cardiff at 8 a.m., reaching Paddington about 11 o'clock, whence members will be conveyed to Greenwich by motor coach.

River Pollution.—The Department of Scientific and Industrial Research have published the Report of the Water Pollution Research Board for the year ended June 30, 1929. It includes a Report by Dr. H. T. Calvert, Director of the Water Pollution Research, in which he refers to the work which is being carried out by the Research Sub-Committee on affluents appointed by the Institution of Gas Engineers in 1926 to consider the methods of overcoming the difficulties associated with the disposal of liquor effluents from gas-works. The report is obtainable from H.M. Stationery Office, Adastral House, Kingsway, W.C. 2, price 9d. net.

South Metropolitan Co-partnership Festival.—Preliminary arrangements have now been completed for London's largest Co-partnership Festival to be held at the Crystal Palace on June 28. It is anticipated that nearly 10,000 persons will attend the Festival, at which an address will be given on the aims of co-partnership. On the lighter side of the day's events there will be community singing, gymnastic displays, and a varied programme of sports. The preliminary heats of many of the field events have already been run at the South Metropolitan Gas Company's sports ground at East Greenwich. It is just over forty years since the first of these festivals was organized by the Directors of the Company for the benefit of employees and their wives.

Mr. Auckland Addresses Cardiff Rotary Club.—Mr. R. J. Auckland, F.C.I.S., the Secretary of the Cardiff Gas Light and Coke Company, lectured to the Cardiff Rotary Club on June 16 on "Some Phases of the Gas Industry," saying that if the last century was known as the age of coal and steam power, it might well be said that to-day they were living in the age of gas. The old habit of heat from coal fuel was disappearing in the increasing demand for fuel in gaseous form. In fact, life in a modern city would be impossible without the present-day service of gas and electricity. Mr. Auckland strongly advocated the co-partnership system, and said this had worked most advantageously in regard to his own Company during the constant progress of the past 20 years. They found that men worked better because they were more content and felt safer. He was glad to know that the principle was being adopted generally throughout the gas industry.

American Tar Distillates Output.—The American Tariff Commission have issued preliminary particulars on the production of coal tar crudes in the United States in 1929. These figures have been compiled jointly with the Bureau of Mines, and are believed really to represent the total output of the country. The figures are as follows: Pure benzole, 25,119,000 gallons; motor benzole, 102,810,000 gallons; carbolic or middle oil, 214,574 gallons; dead or creosote oil, 167,685,000 gallons; naphthalene, 38,984,000 lbs.; other distillates, 10,007,000 gallons; coal tar pitch, 646,000 tons; solvent naphtha including xylole, 7,896,000 gallons; refined tars, 2,441,000 barrels; total coal tar, 736,864,000 gallons, and total tar distilled, 367,340,000 gallons. The figures show a 25 p.ct. increase in the production of creosote oil as compared with 1928; an increase of nearly 50 p.ct. in the output of refined tars; and an increase of nearly 20 p.ct. in the production of solvent naphtha and light hydrocarbons.

Scottish Junior Gas Association (Eastern District).

Annual Outing and Visit.

The Annual Outing and Visit of this Association took place on Saturday, June 14, at Dunfermline.

During the forenoon the members and gentlemen friends visited the gas-works, where they were shown round by Mr. Campbell, Engineer and Manager, assisted by Messrs. S. Smith, J. Scobie (President), W. Ramage, and H. Brown, while the lady friends were conducted over the Linen and Embroidery Works of Messrs. Hay & Robertson, Ltd., also the Carnegie Baths, Clinic, &c. Luncheon was served in the Bruce Restaurant, after which sports parties were arranged, the results of some of which were as follows:

Putting.—(1) Mrs. Burns, Leven. (2) Mrs. Garrie, Burntisland.

Golf.—(1) Mr. A. Turner, Dunfermline. (2) Mr. W. Alexander, Dunfermline. (3) Mr. T. Henderson, Kelty.

Bowling.—No. 2 Rink, J. Richmond (Penicuik) skip.

On completion of the sports items, the various parties were conducted over the famous Pittencrieff Glen and Gardens, finally gathering at the Tea Rooms, where they were met by Bailie Smith, Convenor of the Gas Committee, and entertained at tea on the invitation of the Gas Committee of the City and Royal Burgh of Dunfermline. This concluded a most successful season's activities.

Annual Meeting of Plymouth and Stonehouse Company.

Mr. J. H. Ellis, Chairman of Directors, presided at the Annual Meeting of the Plymouth and Stonehouse Gas Light and Coke Company on Wednesday, June 18, several hundred shareholders and co-partners being present. The report showed that the balance standing to the credit of profit and loss account amounted to £34,581, and the Directors recommended the payment therefrom on July 1 of a dividend for the half-year to March 31 next at the rate of 8 p.ct. per annum on the ordinary stock, 13s. 6d. per share on the additional shares, and 13s. per share on the new shares, less income-tax. This will absorb £16,881, leaving £17,700 to be carried to the credit of the next account.

The quantity of gas sold again showed an increase, which was very gratifying having regard to the mildness of the winter. The sale of gas-consuming appliances during the year constituted a record. The Directors had applied to the Board of Trade for a Special Order enabling the Company to acquire land and carry out works to meet the increase of the Company's business and to raise additional capital for these purposes.

Moving the adoption of the report, Mr. Ellis said at their last annual meeting he stated that the year was the best since he had been associated with the Company. The showroom sales of gas-consuming appliances amounted to no less than £28,791.

Notes from Scotland.

Cupar Undertaking's Centenary.

The Cupar Gas Company, Ltd., have completed 100 years of existence, and, despite the introduction of electric light to the town, the sale of gas last year was the largest in the history of the Company. The most important event in the history of the Company took place in 1915, when the Woodall-Duckham vertical retort plant was built and the capital increased to £20,250. The amount of gas sold in 1921 was 36,760,000 c.ft., and the gas made during the past year reached the record of 52,474,000 c.ft. The present price of gas is 3s. 9d. per 1000 c.ft. Consumers of over 250,000 c.ft. are charged 3s. 4d., and the price for power gas engines is 2s. 4d.

Shifting Lochee Gasholder Tank.

The gasholder trouble which has arisen at Lochee as a result of placing a new tank on insecure foundations is estimated to cost the Dundee Corporation over £10,000. Following a discussion at a meeting of the Gas Committee of the Town Council, it was learned that the estimated expenditure would be £10,350—dismantling and re-erecting the tank £5850, foundations £2500, new site £1000, and probable repairs £1000. The total original cost, including foundations, was roughly £16,000, and the total estimate now reaches £26,350. The recommendations of the Sub-Committee appointed to deal with the matter, including the acceptance of the offer of Messrs. Robert Dempster & Sons, Ltd., of Elland, were unanimously approved.

XUM

A Visit to Messrs. Sugg's Ranelagh Works.

On Thursday, June 19, members of the Southgate Chamber of Commerce, under the Presidency of Mr. S. B. Chandler, A.M.I.Mech.E., Distribution Superintendent to the Tottenham and District Gas Company, paid a visit to Messrs. William Sugg & Company's Ranelagh Works, Chapter Street, Westminster.

The visitors were received by Mr. Philip H. Sugg (Chairman of the Company), Mr. W. Mattock (Director), Mr. J. W. Lofts (Sales Manager and Director), and other officials of the Company; and a tour of inspection was then made of the works.

It is over three years since the Southgate Chamber of Commerce last visited these works, and several improvements and extensions to the plant were noted. Among the shops visited were the machine shops, where various types of screws, bolts, and parts of gas cocks, &c., are turned out, by automatic and semi-automatic processes, the foundry, brass finishing, and other departments, including spinning, stamping, metal polishing, assembling, plating shops, tinsmiths', testing room, and steatite shop. The last mentioned shop is very interesting, in that, as Mr. Philip Sugg later explained to the visitors, it is probably the only one of its kind, not only in this country, but in the world, where steatite is worked for commercial purposes. Steatite is utilized among other things for burner nozzles and by-pass jets, as it has very great heat resistance. The visitors were interested in the lamp assembling shops, where, among other things, the latest order of lamps for Scarborough, which is well known for its gas lighting, was being dealt with. There were also some interesting examples of garage lamps, which are so thoroughly protected that it is claimed that they may be sprayed with petrol while alight, and yet not catch fire. In the testing room the cocks are tested for gas-tightness under air pressure in water. In the foundry there is a miniature blast furnace for iron work; the melting of other metals for casting work is carried out in crucibles below floor level.

The Company's own make of gas fire, known as the " Red Sphinx " fire, was seen being assembled.

After the inspection of the works the visitors were entertained at tea in the main showroom, at the kind invitation of the Directors, and each member was presented by the firm with a brass ash tray, turned at the works, as a memento of the occasion.

Mr. PHILIP SUGG, in extending a welcome to the visitors on behalf of himself and his colleagues, said how glad they were to have the Southgate Chamber of Commerce with them once more. Three years ago the firm had the pleasure of entertaining them, and on that occasion they went away with happy memories of the visit, and with some idea, any rate, of the difficulties which they were up against in the production of the articles manufactured there. He felt sure they would go away this time with the same happy memories, and trusted that the firm might again have the pleasure of their company. It was very gratifying to him, continued Mr. Sugg, that this visit should take place during the year of office of his good friend Mr. Chandler. He would congratulate him on his election; he would, Mr. Sugg felt sure, give very good service during the time he was President. Mr. Sugg then went on to speak of the progress of the firm, from the time when manufacture first started in 1838. The old building, where business commenced, was later deemed to be unsafe, and his father decided to move to the works which they had visited that day. The business was now approaching its 100th year, and they had lately found it necessary to take another works in Angel Road, Edmonton, where they were proceeding with their manufacture of cookers.

Mr. CHANDLER, in extending the thanks of his Association to the firm for their hospitality, said that to see the details of the manufacture of the appliances which they had in daily use in their homes came somewhat as a surprise to many of them.

Messrs. Sugg, said Mr. Chandler, had always kept abreast of the times. There was no case where the matter of illumination or cooking was concerned that the firm could not cope with, and cope with successfully. They were very much obliged to the Directors and the guides for this visit. Not one of them was going away without having learnt something, and he hoped at some future time they might accept Mr. Sugg's kind invitation to visit them again.

Mr. C. STANLEY BROWN seconded the vote of thanks to the Company.

Mr. J. W. LOFTS also associated himself with the remarks of Mr. Sugg.

Mr. W. MATTOCK returned thanks on behalf of the staff for what had been said in regard to the interesting manner in which the guides had conducted the parties round the works. He was sure it had been as much a pleasure to them as it had been to the visitors. The last 25 years, he said, had been the busiest time in the Company's history, and during that period they had more than trebled their business. In spite of all they had heard about electricity in the last two years, the firm had kept a record number of workmen, and had, indeed, practically been working overtime throughout the whole of the year.

Before leaving, the visitors inspected the showrooms, where many different types of lighting fittings were on view, together with the firm's gas fires, cookers, and large cooking installations.

London Juniors' Annual Summer Visit.

An Enjoyable Day at Eastbourne.

The annual summer outing and ladies' day of the London and Southern District Junior Gas Association was spent this year at Eastbourne, on Saturday, June 21.

At the kind invitation of the Management, a visit of inspection was paid in the morning to the works of the Eastbourne Gas Company.

DESCRIPTION OF PLANT.

All retorts are of the horizontal type, with regenerative settings, and stoked with one Fiddes-Aldridge and one Guest-Gibbons machine, with a Drakes transporter on the discharge side. Electric power is generated on the works by National gas engines. There are two retort benches, in each of which there are seven and eight arches respectively, with settings of eight 24 in. by 16 in. by 20 ft. through D retorts; capacity approximately 2 million c.ft. per diem.

There is a Humphreys & Glasgow C.W.G. plant of two units, with a total daily capacity of 900,000 c.ft. During the last twelve months an additional 1¼ million unit has been installed with back-run process, waste-heat boiler, and turbine-driven blowers.

The coke-handling plant was erected in 1923 by Messrs. Drakes, of Halifax. Here the coke, after being quenched, is elevated, cut, screened, and graded into hoppers, which serve into railway wagons, or bags for sale in yard or delivery into the town. The sulphate of ammonia plant has a maximum capacity of three tons per day, and comprises a Walker still and saturator of the enclosed type with centrifugal dryer, installed by Joseph Taylor, of Bolton. British standard road tar is prepared in a third tar dehydrator of 24 tons daily capacity.

After the inspection of the works, the visitors were entertained at luncheon by the Company at the Angles Hotel, Royal Parade—Mr. BENJAMIN BRADFORD (Deputy Chairman of the Company) presiding.

The Loyal Toast having been honoured,

Mr. F. ELIOT WILLIAMS, O.B.E. (Director), said it gave him very great pleasure, on behalf of the Eastbourne Gas Company, to welcome to Eastbourne members of the London and Southern District Junior Gas Association. He had to apologize, he said, for the absence of Mr. Frank Jones, the Chairman of the Company; but he was a very busy man, and had been unable to find time to be there. Eastbourne had been very much in the forefront lately in connection with gas matters, continued Mr. Williams. First there was the very successful British Commercial Gas Association Conference; then the Company had entertained the Southern Association of Gas Engineers and Managers; and now the London Juniors were with them.

Mr. F. S. LARKIN (President of the Association), responding to the toast, said that visits of that nature were always productive of good; they saw in every works something to be copied. Mr. Larkin went on to refer to the honour that had been done to the profession by the Knighthood of Sir Francis Goodenough. No man in the gas industry, he thought, had done more to deserve that honour than had Sir Francis; and he (the speaker) had asked their Secretary to write to him and tell him how cordially the Association wished him health and prosperity. Turning to the subject of education, Mr. Larkin said that to-day the industry was in crying need of efficient young men. Mr. Frank Jones had faith in the industry, for he was putting his own son into it. But what were the Juniors doing? He could only speak of the London Juniors, and they had 25 members who had taken their Degree in Science. These men were capable of taking up responsible positions; and he did feel very strongly that the Junior Associations, in promoting technical training, were doing all in their power to encourage these men to go forward. Mr. Shapley, in his recent Presidential Address at Leeds, had referred to the question of adequate remuneration. This question was one to be stressed by all who were in a position to do so. They must get companies to realize that highly trained men were necessary to the well-being of the industry. " In conclusion," said the President, " I can only say that I am sure that with the opportunities afforded by the Institution Education Scheme, if the prospects held out are similar to those in other professions, there will be no lack of young men of a suitable type to come forward to carry on the work of our industry."

Mr. T. H. PRATER (Margate; Senior Vice-President) proposed the toast of the Eastbourne Gas Company, and briefly referred to one or two points of interest in connection with the works.

Mr. GILBERT B. SODDY (Director) responded on behalf of the Company, and said they appreciated very much what Mr. Prater had said about the works.

Mr. J. H. GOLDSMITH (Junior Vice-President) proposed the toast of " The Chairman," to which Mr. BRADFORD briefly responded.

After luncheon members were free to explore the charms of Eastbourne and its environments.

Reflection from Road Surfaces.

In a prefatory note to a Report of the Illumination Research Committee of the Department of Scientific and Industrial Research, Mr. C. C. Paterson, O.B.E., remarks that among the factors which affect visibility, the brightness of the road surface is one of the most important, and this brightness is a function not only of the illumination of the road, but also of its reflection characteristics. The study has given the not unexpected result that, owing to the special conditions under which a road surface is illuminated and viewed, the ordinary laws of diffuse reflection not only do not apply, but are absolutely valueless as forming any guide to the relation between the illumination and the brightness of any portion of the roadway.

The report concludes with a summary, in which it is stated that measurements have been made of the reflection factors of four different kinds of road surfaces, including tarmacadam, for a large range of angles of incidence and directions of view. It has been found that, where the light is incident very obliquely, the brightness, especially when the surface is viewed obliquely, is greatly in excess of that which would be found by calculation on the assumption of perfect diffusion; in some cases it is several hundred times as great. For a wet surface the effect is still more marked, but the measured values of the reflection factor are liable to large uncertainties. When the direction of view is in the plane at right-angles to the plane of incidence of the light, the reflection factor is much more constant, and, for a dry surface, generally lies between 10 and 30 p.ct. Examples are given to show that the variation range of brightness of a road is much less than the variation of illumination, owing to the enhanced values of the reflection factor at large angles of incidence; and certain conclusions are drawn as to the relative effectiveness of various placing arrangements commonly employed for street lamps, considering the matter solely from the point of view of the number of bright streaks of roadway produced, and the wide distribution of these streaks so as to facilitate the detection by silhouette of vehicles and other objects on the roads.

The report, which is written by A. K. Taylor, is obtainable from H.M. Stationery Office, Adastral House, Kingsway, W.C. 2, price 6d. net.

A Civic Visit at West Hartlepool.

[From the "Northern Daily Mail."]

Having inspected the production of everything from ladies' hats to steel plates and oil engines, the Mayor and Corporation of West Hartlepool decided to turn their attention to the manufacture of gas and the supply of water, and on June 12 paid a visit to the works plant of the Hartlepool Gas and Water Company. The party were met by the Chairman of the Directors (Mr. Stanley Appleby, J.P.) and Mr. J. Bradshaw (Secretary and Manager) and conducted round the works.

Before the party dispersed, Mr. Appleby, in a short speech, remarked that it was the largest party the Company had entertained, but they welcomed the visitors very heartily. He complimented the Mayor (Alderman Hope) upon his idea of civic visits to local works, because he said he felt that it was likely to promote the better understanding that was vital when such an undertaking as theirs was run by a private company.

The Mayor, replying, said they had enjoyed the generous hospitality of the Directors of the Company. The Corporation were pleased to visit the gas and water works because they were proud of having them in the borough.

To Mark the Occasion.

To mark the occasion of this visit to their works by the Mayor and Corporation, the Hartlepool Gas and Water Company have published a neatly compiled and beautifully printed brochure, illustrating and describing the progress of the gas and water undertakings since their formation in the year 1846, under the chairmanship of Mr. J. A. West, whose photograph appears as a frontispiece to the publication.

The booklet, which bears a striking cover design, tells something of the progress of the gas industry as a whole before going on to particularize on that of the Hartlepool undertaking. The first gas-works were erected in 1836 by Mr. J. A. West, and ten years later the Hartlepool Gas and Water Company was formed by Act of Parliament with a capital of £9000. By 1850 the manufacture was 80,000 c.ft. per day; the maximum daily output at the present time is 2,323,000 c.ft. A number of excellent photographs show views of the various works of the undertaking, and a final section gives some details of the welfare work of the Company. In this connection, it is interesting to note that one of the War Memorial Cottage Homes was fully subscribed for by subscriptions from the Company's employees.

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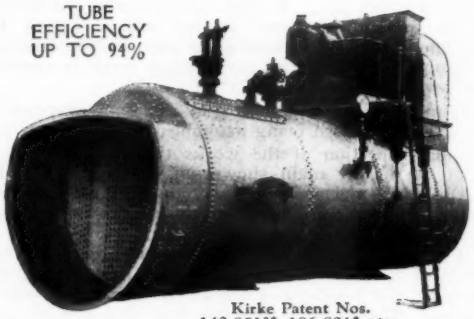

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Nottingham Officials' Long Service.

The Nottingham municipal gas undertaking possesses a distinctive record of long services of officials concerned in both its engineering and clerical departments. Of this further striking evidence was afforded at an assembly on June 16, in honour of three members of the Accountant's staff, upon their retirement after a period of work extending in combination over 153 years. The largest aggregate was presented in the case of Mr. W. Ludlow, who had been associated with the Department for 55 years, he being presented with a handsome chiming clock. Mr. G. Shelton, whose total was that of 52 years, was made the recipient of a china cabinet, and the gift to Mr. J. H. Sanders, who had 46 years' service to his credit, consisted of a mahogany timepiece.

Following tea, the presentations were made by Alderman Sir Albert Ball, J.P., Chairman of the Gas Committee, who referred to his own long service as Chairman of the Committee which had always been to him a great source of pleasure. He remarked upon the growth of the industry, which, he said, was still vigorous and had before it a great future, especially if they could rely on the sterling service of men like those who comprised the staff of the Nottingham Gas Undertaking. He commended the retiring officials for their long and honourable terms of valuable work of which they had every reason to be proud. The recipients suitably replied. Mr. R. H. Mason, the Gas Accountant, thanked Sir Albert, and paid tribute to the three retiring officials. Mr. J. Wilkinson, the Gas Engineer, also added his appreciation. A reply by the Chairman ended a very happy gathering.

Statutory Gas Meter Inspectors.

Visit to Pound Lane Meter Works.

The Association of Statutory Gas Meter Inspectors were entertained by the Directors of the Gas Light and Coke Company at their Pound Lane (Willesden) Meter Works on June 18. The Association, under the Chairmanship of Mr. H. N. Barrow, were officially welcomed on behalf of the Company by Sir Francis Goodenough, C.B.E. (Controller of Gas Sales), in the absence of the Governor, Sir David Milne-Watson, LL.D., D.L., and also by Mr. C. Holt, Manager of the Pound Lane Works.

Among those present were Mr. Stephen Lacey, Distribution Engineer and Deputy Controller of Gas Sales; Mr. J. G. Clark, Manager of the Research and Training Section at Watson House; Mr. F. S. Larkin, Manager of the Fulham Stove Works; and other senior officials of the Gas Light and Coke Company.

Luncheon was served to the visitors in the staff dining hall —Sir Francis Goodenough presiding.

The Loyal Toast having been honoured,

Sir FRANCIS, in extending a hearty welcome to the visitors, said that he had to express the very great regret of Sir David Milne-Watson in being unable to be present to welcome them. Sir David had to be in Berlin at the World Power Conference, not only because he was President of the Institute of Fuel, but because he had been appointed by the Government as one of the British delegates. Sir David had asked him to extend his good wishes to them. Sir Francis said he hoped they would be interested in the Company's arrangements for the testing of meters. He was glad that the Association should come there and see the care they were taking on their side to ensure that the instruments the Company were supplying for the registration of gas to their customers were as accurate as possible. The meter inspectors were important people to the gas industry, continued Sir Francis. They were the entirely impartial authority who enabled the gas companies to satisfy their customers that the meters were tested independently and were as accurate as possible. The meter was an extraordinarily accurate instrument, considering the conditions under which it was used. They in the Gas Light and Coke Company had so been able to establish their customers' confidence that only ½ p.ct. of their total meters were sent back in the course of a year as a result of complaints by consumers. A great many, however, were brought in by the Company to ensure that their gas was being registered properly. Only 4 p.ct. of the gas sent out was unaccounted-for. Of those meters brought in for testing, half were found to be correct.

Mr. BARROW, in reply, said they regretted the absence of Sir David Milne-Watson; and he asked Sir Francis to convey to the Directors the Association's very great appreciation of this invitation. He said how pleased they all were at the honour of Knighthood recently conferred upon Sir Francis. It was an honour not only to the Gas Light and Coke Company, but to the whole industry. Referring to the testing of meters, Mr. Barrow said that this was the only instrument for the measurement of the quantity of gas used, and it was therefore essential that it should be accurate. Their Association stood between the undertaker and the consumer. They did their best to do their part. If a gas meter was disputed, the objector could go to an independent authority; but if an electrical meter was disputed there was no impartial authority to check it. There was no doubt, concluded Mr. Barrow, that electrical undertakings would soon come under the same Act as gas undertakings.

Mr. W. GORDON (Vice-Chairman), who supported Mr. Barrow, remarked that in his long experience he had found no commodity that was measured with greater accuracy than coal gas.

In the afternoon an inspection of the works was made. A full account of these, and of the work that is done there, was given in the "JOURNAL" for Oct. 30 last (p. 318) on the occasion of the official opening of the premises by the President of the Board of Trade.

The total number of meters on the Company's districts now exceeds 1,300,000. Of these, over 750,000 are of the automatic prepayment type. The Company are now maintaining this large number of meters with a working stock of about 2½ p.ct. The total number includes over 280,000 of the high-capacity type, which were introduced some seven years ago after a previous experimental period of some five years. The new type has reduced the range of sizes of wet and dry meters now purchased by the Company from 37 lights and standard types, to 12 only of the latest type, ranging from 50 c.ft. to 15,000 c.ft. capacity.

The new meters with capacities up to 15,000 c.ft. per hour can, in these days, be fitted above head level on walls in factories and large business houses, &c., leaving the floor space below free for more useful purposes to the customer.

The introduction of additional stuffing boxes in these meters has considerably reduced leakages, and heavier glazed dial cases without metal covers has practically reduced the heavy number of previous breakages of dial glasses to a minimum, thus saving the customers and gas undertakings much trouble and inconvenience and resulting in a large reduction in maintenance costs.

Of the very large number of meters in use in this Company, it is interesting to note that 11 p.ct. are returned annually for various reasons, all of which are tested for the Company's information and records. The number of meters sent to official testing stations for customers' information and settlement of disputes is surprisingly small, being only ½ p.ct. on the total number of meters in actual use on the district. This low figure of ½ p.ct. seems to indicate some fairly general measure of satisfaction on the part of the public, notwithstanding the publicity occasionally given by the Press on the subject of gas meter registration.

About 45 p.ct. of the meters tested by the Company when returned are proved correct, 26 p.ct. proved fast, and 29 p.ct. proved slow, stopped registering, &c. It is sometimes forgotten that an advantage of 1 p.ct. in testing is allowed the customer by the Sales of Gas Act, which provides for 2 p.ct. fast (customers' loss) and 3 p.ct. slow (Gas Company's loss); moreover, the actual percentage of error has, for many years, been found with slow meters to be nearly double that of meters proved fast. It would appear that existing legislation and meter construction combined give in actual practice substantial advantage to the customer.

All new meters purchased are tested by the Company, as are all repaired meters; no meter is issued or re-issued without bearing the official seal.

After the inspection, tea was provided for the visitors.

Corporation Undertakings' Results for 1929-30.

Leicester.

The annual report of the Leicester Corporation Gas Department states that after paying interest on the capital of the undertaking, and deducting the sum of £37,351—being the yearly payment to the sinking fund—and £957 in part payment to the Public Works Loan Commissioners, there is a net profit of £18,223 applicable to the district fund, or by which the Council may, if it thinks fit, increase the present reserve fund of £101,777, or appropriate or set aside a sum to be applicable for the renewal of works under the provisions of the local Acts of Parliament. The Gas Committee recommends that the sum of £8223 be credited to the renewals fund, of which £5500 will be for the renewal of retorts, and the balance of £10,000 placed to a fund for working capital.

Newbury.

The annual report of the Newbury Corporation Gas Committee shows that the net profit on the year's working of the gas undertaking amounts to £1171.

Stratford-on-Avon.

It was reported to a meeting of the Stratford-on-Avon Town Council that the sales of gas during the year had risen by 5 million c.ft., representing an increase of 4 p.ct. The profit for the year, £1034, was better than most of the Gas Committee anticipated, and at the next meeting a further reduction in the price of gas would be recommended.

Institution of Gas Engineers.

Discussion of Mr. Stewart's Paper on the Functions of Coke Ovens.

Mr. H. J. HODSMAN, M.Sc., F.I.C. (Fuel Department, Leeds University), in a written communication, states: It might be concluded both from Mr. Stewart's paper and from the ensuing discussion that a vital factor in selecting the type of carbonizing plant will be the character of the resulting coke product and its suitability for the market. How far can an increased output of oven coke be absorbed by the markets available?

Some of the speakers seemed to think that oven coke might even be sold without great difficulty for use in the open grate. These opinions are not easily reconciled with the call for low-temperature coke.

This is a question hardly to be settled on the debating platform, and in view of the large amount of experimental study of the properties of cokes in recent years, the time should be coming when one can define in measurable terms the characteristics of a fuel for a given purpose—say, for use in an open grate. The writer believes that this is already true in considerable measure as a result of the experiments made with the assistance of M. F. Bligh, J. H. Dyde, and G. Milner at the University of Leeds. It is possible to forecast the performance of a fuel in an open grate of a vertical fronted type from laboratory measurements. Thus it appears that the radiant efficiency is largely determined by the reactivity and the bulk density of the coke, and may be predicted from a knowledge of these factors. This conclusion has been tested on several high and low temperature cokes. Now the low bulk density of vertical retort coke due to its light and angular structure has an important influence in raising the output of radiation in a manner scarcely appreciated hitherto. Indeed it is possible to consume the fuel under certain conditions with an efficiency approaching that of a gas fire. In view of the relative costs of the fuels the importance of this statement is obvious and should receive due weight in considering the suitability of carbonizing systems for providing domestic fuels.

The Rationalization of the Gas Industry.

By GEORGE EVETTS, M.Inst.C.E., M.Cons.E.

(*Continued from p* 573.)

The first two articles dealt with an examination of rationalization in general, and (1) by formation of holding companies, (2) by working agreements, (3) by amalgamation.

(4) *Purchase of gas in bulk from neighbouring gas companies or coke ovens.*—The principal difference between buying from a neighbouring company and a coke oven is with regard to continuity of supply. The selling gas undertaking has an equal statutory responsibility with the buyer, and therefore the purchasing company is satisfied that the seller will do everything possible in order to continue the supply. In the case of a coke oven plant, however, there is no such responsibility, and although the agreement may be very tightly drawn, the seller may be in such difficulties that he would prefer to risk an action at law rather than continue the supply. Supposing, for instance, the steel industry got so bad that metallurgical coke became saleable only at such a price that it was crippling the coke oven owner to continue operating his plant merely for the selling of gas, he would probably prefer to risk heavy damage for breach of contract than to continue to manufacture at a heavy loss. There have been cases where the supply of gas has ceased owing to the impossibility of selling metallurgical coke at an economic price. In the case of a gas undertaking selling in bulk the manufacture of gas must continue whatever the price of coke may be. If coke is cheap then the price of gas must go up, other things being equal; but gas is the primary product, and everything else subservient to it.

In the case of a coal strike the existence of a bulk supply to a neighbouring gas undertaking would raise difficulties. But in cases in which the writer has been interested it is usual to insert a proviso that in the event of a shortage of gas for any reason, the buying and selling organizations are to suffer equal proportionate deductions from their required quantities. After all, this is what would happen in the event of amalgamation or other form of fusion, and it is exactly what one would expect in a business deal of this sort. It is to be assumed that in the making of such a contract the element of risk for both sides is taken into account, and if it is possible to put the financial cost of this risk into the purchase price of gas, then such is included. The writer does not propose to deal with the various methods by which prices are calculated for bulk supplies, either from gas-works or coke ovens, nor does he propose to discuss clauses embodied in these contracts. Other writers and authors of technical papers have presented from time to time typical contracts, and taken together the clauses seem to cover every eventuality.

The bases of price calculation are many and varied. The actual price paid naturally depends on the calorific value of the gas, whether it is purified or unpurified, the amount of main laying carried out by the sellers and buyers respectively, and many other factors. It is not uncommon for the price of gas to be calculated on a sliding scale dependent on the price of coal. In the case of a contract between gas undertakings the price of residual products may also be taken into account, but in the case of purchasing from a coke oven this is extremely difficult.

The value of surplus gas to a coke oven plant has been very carefully considered in the Report of the Area Gas Supply Committee recently issued, and it is clear that the value at the coke oven may vary within very wide limits. The buyer must view the price from a different angle, however. He has to calculate what it is worth to him in view of the conditions under which it is purchased, the risks involved, the financial cost of providing for those risks, and any further treatment which the gas may require on being received at his works on his district.

To take an illustration: There may be a serious deficiency of pressure and quantity at a portion of the district adjacent to a coke oven, and coke oven gas at that part of the district may be worth more than in the gas-works. It is conceivable that in these circumstances it would pay better to take that portion of the requirements rather than 100 p.ct. It may be generally assumed that the very great majority of undertakings could afford to pay more for coke oven gas than the mere surplus value of that gas to the cokery. If the cokery could undertake the statutory obligations of gas suppliers then the surplus gas becomes worth more automatically. This aspect will be dealt with more fully in the next section.

PRICE FIXING.

In fixing a price between two gas undertakings, the calculation of the value of gas sold forms a very useful introduction to the economics of multipart tariffs. Here we have the ideal large consumer. The commodity charge can be calculated on the basis of introducing every element which is a function of the amount of gas produced. The customer charge may or may not be accurately calculated, but a very wide margin of error will have no effect on the ultimate price, seeing that this element of the cost is negligible. The production demand costs and distribution demand costs are factors which can be calculated with all the relevant data at the disposal of the seller. Even the effect on overheads can be computed to a nicety, with the result that of all tariff calculations this is one which can be ascertained with a greater degree of certainty than almost any other.

Dealing first with purchase from coke ovens, it will not be denied that a secure contract at the right price may effect as great a degree of "rationalization" for the buyer as could be obtained by amalgamation or any other form of fusion, excepting only as one of a group of undertakings purchasing gas from the same source. This bulk supply at a stroke solves the problem of raising capital for works, residuals disposal, freedom from risks of nuisance, and other disabilities arising out of the manufacture of gas; it frees the responsible officials from a large part of their labours, enabling them to devote their time and energies in developing the sales of gas. Finally, from the rational point of view, waste fuel is being utilized to fuller advantage, and probably the cokery is put on a safer financial footing.

The same applies to bulk purchase from neighbouring gas undertakings. It often happens that all the advantages of amalgamation can be obtained by a bulk supply. It is clear that if gas cannot be supplied in bulk with advantage, then one of the attractions of amalgamation is missing. Purchase

of gas in bulk entails no change in the statutory relationship, and no concessions demanded as an immediate result. The cost of amalgamation and transfer often wipes out the savings for some years. It is the usual custom to compensate directors at 7 years' purchase of their fees, and officers at 10 years' purchase of salary and emoluments. Added to this, costs of the amalgamating order have to be paid, as well as capital duty where the nominal amount of capital is increased. The total result may be an addition of anything from £80 to £175 per million c.ft. when calculated on the sale of the undertaking being absorbed.

COMPENSATIONS.

It is often claimed that in compensating officers savings are effected, seeing that the actual salary bill is reduced by the amount previously earned by the officers who have been displaced and compensated. This is not always the case. Take the principal officer as an example. He has given his time to the peculiar needs of the undertaking about to be absorbed, and it is assumed that his services have justified the salary paid. It is idle to pretend that this undertaking could be carried on without any attention being given to the duties recently carried out by the compensated officer. The result is often that a subordinate is given an increased salary for additional responsibilities. Therefore some of the saving becomes wiped off immediately. In due time the directors and chief officers of the larger company ask for increased fees and salaries for increased responsibilities and larger scale of operations, and almost invariably these increases are granted. The result is that in a very few years no great decrease in salaries can be traced. All this points to the desirability of considering the purchase of gas in bulk as an alternative to amalgamation.

Each case must be considered in all its bearings, but it is desirable to repeat here that there are many instances where many of the savings and advantages can be effected by bulk supply. There are also many examples where considerable savings can be effected by bulk supplies, which are at present not being taken advantage of for personal or other reasons.

It is a very great pity that responsible officers will not make it a rule to survey the surrounding undertakings before entailing expenses in works removal, reconstruction, or trunk mains.

The writer recently had a case of a small undertaking making 45 million c.ft. per annum and needing new works, which were estimated to cost, after allowing reasonable margin for growth, £25,000. The works had to be moved to a new site, and therefore the expense was likely to be heavy, and it was difficult to see how these works could be equipped without increasing the price of gas. Hearing that a neighbour (a municipal undertaking) was intending to go in for works extensions, the engineer was approached with a view to making these extensions on a larger scale and supplying gas in bulk to the writer's clients. After negotiations, a price was fixed involving 30 p.ct. discount from the ordinary selling price, and this is actually slightly lower than the cost of production at the existing works, and, instead of £25,000 being spent, it is anticipated that £5000 will be spent instead, on the high-pressure main connecting the two works. The smaller undertaking, therefore, in addition to avoiding the difficulties of raising capital, has been enabled to retain the price of gas at its present figure instead of facing an increased price.

(5) *By Purchase of Gas from a Grid.*—There are in this method more possibilities of effecting economies and working towards true "rationalization," but it must not be assumed that the gas grid is necessarily a cure for the financial difficulties of the smaller undertakings. The electrical analogy only answers up to a certain point. For instance, the cost of generation in a small electricity station bears a higher proportion to the cost of a large station than is the case with gas undertakings of a comparable nature. Further, the equalization of voltages in the use of electricity and the merits of standardization are more important than in gas. There is a flexibility about gas mains, services, meters, and consuming appliances that is not possessed by the corresponding elements of electrical installations.

LONG-DISTANCE TRANSMISSION.

With regard to long-distance transmission, beyond knowing that there are leakages and that the cost of electrical transmission is material, the writer has no knowledge of the economics of the electrical grid. But it must not be overlooked that transmission of gas over long distances might easily be more costly than the difference between costs of production at various points in a grid. It might in effect be as cheap to transport coal as to transport gas, and it may be even cheaper if there is a good demand for coke at a small works. It can be stated without exaggeration that the price of coke is the key to the situation. The writer has known of more than one case of amalgamation where the small works has been kept open because it has produced gas at a reasonably high state of efficiency in relation to its size, and the price of coke has kept down the net costs of that works to such a figure that it does not pay to put down a connecting main and transport the gas. It is well known that towns and villages within a short distance of one another have widely differing selling prices for coke, and there are some small towns which, being relatively unimportant, escape the severe competition of "dumped" coke. At the same time, even if there is no direct financial advantage to be gained, the average undertaking would be better off in buying gas from a grid and so avoid the recurring troubles of finding money for extensions, and getting those extensions carried out, to say nothing of getting rid of the troubles of smoke, dust, noise, sulphate making bye-product effluents and so on.

In dealing with the disadvantages and cost of long-distance gas transmission, while extensive grids may not be economical, yet localized grids could be made to pay, although the matter is not so simple as it appears on first acquaintance. The Government Committee on Area Gas Supply have, within the past week or two, issued their very interesting and carefully considered Report. The Committee have not dealt in general terms with gas grids, but have concentrated on a grid for the supply of surplus coke oven gas in the Midlands.

The Report, after dealing with what has been done in other countries in the disposal of surplus gas, gives the estimated amount of coke oven gas for disposal during the next few years together with the estimated amount of gas to be sold by existing undertakings for domestic and other purposes. The problem of coke disposal is also considered very fully.

The following table shows the amount of gas disposed of in 1928 and after 1930 in Yorkshire, Lancashire, Derbyshire, Staffordshire, and Lincolnshire, in millions of cubic feet.

—	1928.	After 1930.
	Million C.Ft.	Million C.Ft.
Total used by coke oven owners	59,705	79,226
Sold to gas undertakings	4,217	8,397
Sold to other undertakings	2,158	2,296
Available for other purposes	2,602	11,744
Total	68,682	101,663

This shows that although the amount sold to gas undertakings will double, yet the amount of gas disposable will quadruple, and it is pointed out that large quantities of the gas now used by the coke ovens for internal purposes could be made disposable if remunerative prices were offered. If all the ovens were modernized, the surplus gas available (including that already sold to gas undertakings and others) would be 49,740 million c.ft. This is equal to the output of the following towns: Sheffield, Leeds, Manchester, Salford, Stretford, Oldham, Bolton, Halifax, Birmingham, Derby, Nottingham, and Leicester.

In order to get a proper perspective of the Ruhr scheme, it is stated that it is expected in 1930 that the amount of gas distributed will reach 21,000 million c.ft., not all to gas-works. The Ruhr gas undertaking is not yet a profit-earning concern.

The Report discusses also the value of coke oven gas viewed from three standpoints, and the following are the conclusions based on 80 million c.ft. per day:

(1) For gas used in ovens at the ovens	1·02d. per therm
Plus purification, distribution, and storage of coal and gas	0·87d. ,, ,,
Total is	1·89d. ,, ,,
(2) For gas used under boilers	0·36d. per therm
Plus costs as before	0·87d. ,, ,,
Total is	1·23d. ,, ,,
(3) For gas run to waste, first cost	*Nil*
Total with distribution, &c., as before	0·87d. per therm

The above figures deal with the South Yorkshire localized network proposed by the Committee, which comprises the distribution of 80 million c.ft. of gas per day, collected from nineteen coke ovens, the distribution being equal during the twenty-four hours of the day. The length of mains would be 73½ miles, varying from 6 in. to 30 in. in diameter, and the cost as follows:

	£
Mains	232,800
Laying (3 ft. cover)	241,700
	£474,500
The compressors would cost	63,400
Total	£537,900

Leaving storage out of the question and taking 80 million c.ft. per day at 275 days a year, we get 22,000 million c.ft. per annum, or a capital cost of only £24 per million c.ft.

dealt with for the trunk mains and compressor plant. This is a very low figure, and if rationalization could be secured on a large scale at this rate of additional capital expenditure, then it would be welcome. This is not the end of the story, however, because the coke ovens must provide purification plant and balancing holders. However, the total effect of all the requisite operating and capital charges is only 0·87d. per therm of which only 0·32d. per therm is for compression and distribution charges, including capital costs of mains and compressors.

With the highest replacement value of gas at ovens, the total cost of gas from the grid is 1·89d. per therm, and this must be a low price for many of the undertakings situated within the radius of the network. As before mentioned, the cost of gas used under boilers becomes reduced to 1·23d. per therm, and gas bled (with no initial value) 0·87d. per therm. The Committee make the following comment in relation to these figures in paragraph 169:

> From this table we draw the conclusion that whether or not it would pay the coke ovens to heat their ovens with producer gas and so release the gas at present used for heating them, there is, in the case of gas used under boilers and gas bled, a sufficient margin to make the network a practical possibility.

In paragraph 188, the following occurs:

> It would be idle to deny that there is some element of speculation in our proposal for a gas network in South Yorkshire. . . . It is an experiment which is worth trying. On the basis of the estimates we have made, the network should prove a financial success . . . but arrangements should be made to give financial assistance to the undertaking which is prepared to try the experiment . . . and that if an application is made . . . within the scope of the Developments (Loans Guarantees and Grants) Act, 1929, to the Committee set up under that Act, it should receive sympathetic consideration.

These statements should be significant in warning enthusiastic advocates of linking up and gas grids that nothing spectacular can be expected. Here we have the choice of an industrial area, an amount of gas equal to the consumption of many large towns, nineteen centres of production with gas certainly at lower rates of manufacture than the average gas-works, and a skilled Committee speaking in very guarded terms of "some element of speculation" and "the undertaking which is prepared to try the experiment;" followed by a recommendation of generous Government assistance during the initial stages. The report proves that the gas grid does not necessarily produce a cheap gas supply, or that it is of universal application. There must be many areas, however, in which a saving could be effected and a further step taken towards rationalization; but the conditions must be carefully studied, and a scheme must enjoy the goodwill of all concerned.

In Chapter XV. the Committee discuss matters incidental to the establishment of a network, and, of course, these matters would arise in any grid scheme. Wayleaves for instance, are important, and this is discussed in paragraph 179. The subject of rates is discussed in paragraphs 180 and 181. If this grid results in increased profits it is difficult to see how increased rates could be avoided, but it would be a sad blow if the increase amounted to a direct assessment on the increased profit. The Committee rightly recommend that the matter should be dealt with by the Central Valuation Committee.

Further points discussed are depreciation of mains, supply of gas from the network, profits, security of prices, finance, &c.

Ownership and Operation of the Grid.

The Committee considered the question of ownership and operation of the grid, and, in the writer's opinion, rightly came to the conclusion that it should be operated by the Sheffield Gas Company, who probably have the biggest interest in the absorption of the gas. It is suggested that the accounts of the grid be kept separately and the profits divided proportionately to the capital put into the undertaking by the various interested parties.

The question of purchasing and selling prices of gas from a grid is of great importance. On the purchasing side it is impossible to allocate a certain quantity of gas for a certain area or group of consumers covered in the immediate vicinity of the producers. Therefore the only sound basis is to pay a common price for all gas delivered into the network at a pre-determined pressure.

With regard to the selling price, it may be difficult to work out a fixed price or scale of prices sufficiently attractive to encourage all the undertakings to purchase; but it would be dangerous to base the price on the production costs of the prospective purchaser. It is possible, therefore, that one undertaking will be able to purchase at a much lower rate than its cost of production, whereas in another case, it may be very little less. It may happen on rare occasions that an undertaking situated favourably for the disposal of residual products may be able to produce at a slightly lower rate than the grid can supply. In the case of selling, also, the geographical position of the purchaser cannot be taken into account, and gas should be a common price at all points of a grid in like circumstances.

The question of load factor would not arise if each purchasing undertaking provided storage in conformity with its requirements. In this manner it is simple to devise a block scale of charges depending entirely on the quantity used, with a tariff for industrial consumers which may or may not vary from the main tariff dependent on whether these industrial consumers provided storage. In other words, the load factor would have to be taken into account in such cases.

The writer has prepared a scale for such a grid, and has found that a properly graduated scale can produce a satisfactory economic rate, and, at the same time, provide a scale which is lower than the cost of production for the respective undertakings in nearly all cases.

There is a large scheme in course of development on these lines at the present time in Belgium. A site which, eighteen months ago, was meadow, will, in eighteen months time, be producing 23 million c.ft. of gas per day from coke ovens and producers, but it will be primarily a gas-works, and will be called upon to meet the usual seasonal variations demanded at a gas-works.

The network comprises, under the present proposals, about 75 miles of 20-in. main operated by a separate but allied company. Other cokeries or other producers of surplus gas have been invited to put gas into this grid, all at a fixed price, the price having been determined by the estimates of the company first in the field. Having ascertained that gas can be manufactured at a reasonable profit at this fixed price, any owner of carbonizing plant with surplus gas is certain of a good market, because if gas is surplus to him it must be economic to sell it at the same price as a works newly erected primarily for the manufacture of gas.

The operating or distribution company undertakes the compression and distribution. The purchasers are then given a block scale of charges. They can take all or a portion of their requirements, but are compelled to provide storage equal to a certain proportion of their maximum daily requirements. Many of the undertakings along the line of the grid are customers already, and there is also a good field for industrial gas, with the result that practically the whole of the output of the various carbonizing plants is contracted for. As a matter of fact, the majority of the public gas undertakings are municipally owned. An interesting feature is that the producers as well as the purchasers can become shareholders in the company owning the network, and therefore the network becomes a three-part co-operative scheme.

It should be added that this scheme has been worked out with much less difficulty than would have been the case in this country. The permission to lay the mains along the roads and across water courses, and the actual carrying out of this work has been much more expeditious than any similar scheme would be here, and this freedom from vexatious and hampering restrictions has not resulted in financial exploitation. In fact, the cost of gas from the grid will compare favourably with similar schemes in any part of the Continent.

The grid scheme, therefore, properly handled, could be made an important factor in the rationalization of the gas industry in this country; but it offers nothing spectacular, and it could be made much easier by the removal of legislative and other difficulties.

The purchase of gas from a carbonizing plant at a colliery, whether it be low-temperature or otherwise, offers very few special problems which have not been dealt with already. The principal considerations are the reliability of the plant and the statutory obligations of supply. The constructor or operator of (say) a low-temperature plant, may have an excellent market for his solid fuel and be able to show a perfectly healthy revenue account if he can obtain an economic price for the surplus gas; but he will not find a buyer for this gas until he can satisfy the prospective purchaser that the gas will be forthcoming day in and day out in the quantities required.

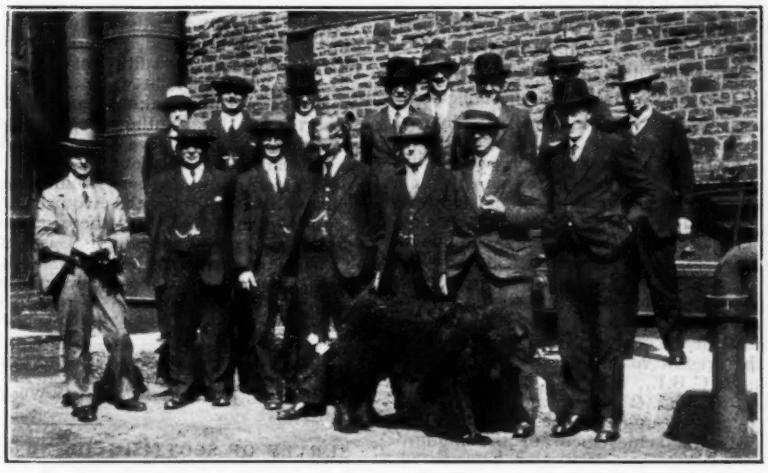
The four plants now under construction or operating in the London gas-works will give valuable experience relating to this important factor. If the supply is satisfactory, there seems to be no reasonable objection to an individual undertaking ceasing the marketing of coke and presenting a proportion of that market to the producer of low-temperature fuel. After all, if the gas undertaking buys in bulk from the neighbouring coke oven, he ceases to become a purveyor of coke without detriment to his undertaking. In the same manner, the supplier, whether it be a separate carbonizing plant or contributor to a grid, must be prepared to shoulder the statutory obligations at present imposed on the gas undertaking. There are cases in which the builder of a low-temperature plant has been content to erect and operate his plant on the gas-works, selling the surplus gas to the gas undertaking, and if the price is right, this is an interesting phase.

The final article will deal with the legislative and administrative difficulties, and how they might be overcome.

(To be concluded.)

Cumberland and Westmorland Gas Managers' Association.

Summer Meeting at Maryport.



AT MARYPORT.

The Cumberland and Westmorland Gas Managers' Association held their Summer Meeting at Maryport on Thursday, June 19, under the Presidency of Mr. J. E. Blundell, of Carlisle.

The chief item of interest was the inspection of the reconstruction work recently carried out at the Gas-Works of the Maryport Urban District Council by their Engineer and Manager, Mr. F. G. Bowness. This consists of a new installation of Glover-West vertical retorts, comprising six retorts of the new 40-in. model arranged in units of two, with a capacity of half a million c.ft. per day of 450 B.Th.U. gas.

The plant is a complete unit with a Spencer-Bonecourt natural-draught waste-heat boiler and gravity-bucket coal elevator of a capacity of 25 tons per hour. The waste-heat boiler is capable of an evaporation of 1050 lbs. per hour with 50° Fahr. super-heat at 100 lbs. pressure. A friction driven Morris skip hoist delivers coke to the producer charging level, and is also capable of raising coal to the coal feed bunkers. The power for this is obtained from Crossley 12-H.P. gas engines in duplicate, which also drive the retort extraction gear and the gravity-bucket elevator.

The new exhausting plant comprises duplicate sets of Waller three-blade rotary exhausters of a capacity of 25,000 c.ft. per hour each, the drives being by direct coupled horizontal steam engine. Works steam is generated by a Spencer Hopwood water-tube vertical boiler capable of an evaporation of 1000 lbs. per hour at 100 lbs. pressure when fired with coke breeze. The plant is now supplying the whole of the gas required, and the visitors keenly appreciated the opportunity of examining this example of a modern method of carbonizing coal.

Messrs. R. B. Glover and C. A. Poulson, of Messrs. West's Gas Improvement Company, Ltd. (the Contractors), were in attendance, and, with Mr. Bowness, acted as guides.

After the inspection, Major C. Irwin, Chairman of the Maryport Gas Committee, entertained the visitors at tea. In welcoming them, he paid tribute to the usefulness of the Association.

Mr. H. J. C. WALTER, J.P., Chairman of the Maryport Urban District Council, in support, said they were proud to be able to have the Association at Maryport and to be able to show them something of interest. He also remarked that Maryport was very fortunate in having Major Irwin as Chairman of the Gas Committee during the difficult period of the reconstruction of the gas-works. (Major Irwin is on the staff of the West Cumberland Bye-Products Company, Ltd.) His practical knowledge had proved invaluable. He also paid tribute to the energy and devotion to his duties of their Engineer and Manager, Mr. F. G. Bowness. He said that since the new plant started everybody had been satisfied, and they had not had a single complaint in the town.

The PRESIDENT, in reply, thanked them for their cordial welcome, and congratulated Maryport on its courage and enterprise in reconstructing its gas-works. From his own experience he could assure them that the estimated savings due to the working of the new plant would be easily attained, and might even be exceeded. "We have to-day," he said, "inspected one of the very latest, and, I believe, one of the most efficient, carbonizing plants of its size to be erected in this country. You will remember that last September I ventured to call your attention at Windermere to a number of points in the policy to be pursued, particularly by the small undertakings which are characteristic of those of our district of Cumberland and Westmorland. There was first the question of electrical competition. There is nothing whatever to fear from electrical competition if we can succeed in recognizing ourselves, and bringing home to the public, the bedrock facts of the superior economy of gas in its sphere of heating, cooking, and lighting. Above all, we must not be led away by any of those too easily accepted statements that efficiency is only to be secured by super-stations, super-works, and enormous networks of cables or pipes. Possibly all these things are necessary to the electrical industry, but in the gas industry the very highest efficiency can be obtained in quite small units. It is far more necessary to make a close study of local conditions and requirements than merely to increase the size of the plant, whether by amalgamation or other means, beyond that dictated by the natural laws of growth.

"With regard to manufacturing plant, it is, of course, quite as necessary for the small as for the large undertakings to avail themselves of every advance in technique and design; and you have an example here in Maryport which shifts the controlling element from the workman to the engineer, while relieving the engineer and manager of details which can safely be left to unskilled attention. There is no need to go over again the advantages of the vertical retort to the manager of the small works. It provides a gas-making instrument which derives its value more from the volume of gas made than from the residuals, with their wide fluctuations in price. It can be relied upon to produce a gas constant in composition, calorific value, and having all those properties which give satisfaction to the consumer. It also gives full value for the attention bestowed upon it by the skilful and energetic manager.

"In the district, I pointed out the need for a vigorous forward policy. No single opening within the area of supply which could be filled by gas should be left unoccupied. It is not merely a question of supplying the cheapest therm. Indeed, it may be quite good policy to load the therm temporarily with capital charges in view of future expansion, rather than starve the undertaking of modern plant and equipment to keep down to a price which must be increased some day. No undertaking can afford to rest in any less safe position than in that attained when the maximum number of therms per head of population within the area is being sold; because, if any portion of this demand is left unsatisfied for any length of time, it will be occupied by the electrical competitor, who, once established, may be extremely difficult and expensive to dislodge. An undertaking might very well be able to sell cheap gas for some years if nothing was spent on modernization and if nothing was put by for maintenance and renewals. Such a policy has only to be mentioned to be condemned; and yet one fears that some owners, whether companies or councils, are liable to take shortsighted views of their responsibilities. Our policy, then, must be inspired by courage, informed by common-sense, and animated by a determination to leave no place anywhere for our competitor to get a footing outside his legitimate sphere."

At the subsequent meeting the following appointments were made:

President.—Mr. J. E. Blundell, Carlisle.

Vice-President.—Mr. Hedley Hoy, Workington.

Hon. Secretary.—Mr. W. B. Hetherington, Keswick.

It was unanimously decided that the congratulations of the Association, and thanks, be given to Mr. J. E. Blundell for his advocacy of a scheme of correspondence classes to be set up by the Institution of Gas Engineers with, if possible, the assistance of the Fuel Department of the University of Leeds and/or other Universities, to assist isolated students to acquire the necessary education to pass the examinations of the Institution's Education Scheme, and that the thanks of the Association be proffered to the "GAS JOURNAL" for its support of Mr. Blundell's proposals.

Notes on New Books.

MODERN GAS FITTING.*

The Authors of "Modern Gas Fitting," Mr. S. D. Phillips and Mr. G. T. Tutt, both of whom are peculiarly well fitted to deal with their subject, have produced a thoroughly up to date treatise—up to date in regard not only to the time of publication but also to the contents; and this dual modernity is by no means invariably associated with the issue of a new technical book. Mr. Phillips is Chief Instructor in Gas Subjects at the East Ham Technical College, and Mr. Tutt is Senior Lecturer at the same Institute; and the authors are to be congratulated on having helped so largely to fill a definite need, for the number of books on this phase of the gas industry's composite practice is few, and, in general, the books are inclined to be slight. The work under review has been written expressly to cover the first three years' course of study in gas fitting of the City and Guilds of London Institute's programme. Vol. II. will cover the final two years of the course, and will necessarily be more advanced. To the present volume there is a foreword by Sir Francis Goodenough, C.B.E., in which he emphasizes in a few words that rule-of-thumb methods are no longer to be tolerated in our industry; and he suggests that "Modern Gas Fitting" will help towards the achievement of the highest possible workmanship.

"Modern Gas Fitting" may be described as a comprehensive text-book for the use of teachers and students in gas fitting. The scope of the book will be indicated if we mention that it extends to nearly four hundred pages, and includes no fewer than 280 photographic illustrations or diagrammatic line drawings. Many of these illustrations are of the latest types of gas-using appliances, and will serve as an admirable guide to the student who desires to fix clearly in his mind the conditions and the functions and the fixing of the apparatus with which he has to deal.

The authors commence by some notes on the manufacture of gas, commendably brief. The book-proper begins with Chapter II., which is concerned with gas pipes and pipe fixings. Then the authors deal in turn with services, pressure, governors, meters, luminous and bunsen burners, cookers, water heating appliances as distinct from the geyser, geysers, and fires and radiators. The last two chapters of the book are devoted to a short dissertation on the elementary principles of heat and ventilation.

Without going into any detail regarding the various sections of the book, it may be stated that the method of treatment, if inclined to be a little bit stereotyped, is clear, thorough, and most up to date. We have one criticism to make, not concerning the book itself, but what comes after it—namely, the index. This is not sufficiently extensive for so voluminous a publication, though in fairness it must be added that the short contents paragraph which precedes each chapter is helpful as a guide to the matters subsequently treated.

* "Modern Gas Fitting," by S. D. Phillips and G. T. Tutt. Vol I. Published by Ernest Benn, Ltd.; price, 15s. net.

ALL ABOUT PIPES.*

The purpose of this book, state the Authors in their Preface, is to provide authoritative data for engineers interested in piping work; and we think that all who buy this work will agree that this purpose has been admirably fulfilled. It is not what may be termed an original book, but it is certainly a very skilful production; it would be difficult to conceive of a more satisfactory method of treatment than has been adopted by the authors. The volume is necessarily a combination of tables and data, and these have been set out with considerable ingenuity. Certain specialized subjects, including heat insulation, water supply piping, oil piping, and gas piping have been ably handled by other contributors, each of whom is a recognized authority in his own field.

The chapter on "Gas Piping" is by Frank W. Steere. We suggest, however, that this section is all too short for a book of piping which extends to nearly 800 pages.

Necessarily the volume will be more attractive to American engineers than to those of this country. As an indication we may mention that the specifications for piping materials and for valves and fittings are those which have been established by the American Society for Testing Materials, and by the American Standard Society.

The printing of the book is excellent, and the book itself is delightfully easy to handle.

* "Piping Handbook," by J. H. Walker and S. Crocker. Published by McGraw-Hill Publishing Company, Ltd.; price, 25s. net.

COMPULSORY TAKING OF LAND.*

In his Preface to this volume, Mr. Borregaard states that differentiation in the once uniform principles governing the subject has made a new edition of this work desirable. The most important cleavage is between compulsory acquisition by private promoters and undertakings on the one hand, and Government Departments, local authorities, and other public authorities on the other hand. Elaborate safeguards secure that the landowner shall make no profit out of the needs of those who themselves seek none. Apart from this general differentiation, which was effected by the Acquisition of Land (Assessment of Compensation) Act, 1919, there are various differences in the matter of procedure (though it is always by arbitration) and evidence in particular instances. All these are noted in this book, the matter of compensation being one of the largest sections. On the question of nuisance, the case of Broadbent *versus* the Imperial Gas Company is cited.

* "The Law Relating to the Taking of Land by Public Companies and Local Authorities," by Thomas Waghorn; revised by R. Borregaard, M.A. Third Edition; published by Effingham Wilson. Price, 5s. net.

SURVEY OF SCOTTISH COKING AND FURNACE COALS.

At the price of 4s. net, the Department of Scientific and Industrial Research, Fuel Research, have published No. 15 of Physical and Chemical Survey of the National Coal Resources —"The Survey of Scottish Coking and Furnace Coals." This is obtainable from H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2.

INSTITUTION OF CHEMICAL ENGINEERS.

At the World Engineering Congress held in Tokio in October-November last, several interesting papers were presented by members of the Institution of Chemical Engineers. Copies of these papers, which include "The Training of the Chemical Engineer," by Prof. J. W. Hinchley, Wh.Sc., A.R.C.S., F.I.C.; "Bye-Product Ammonia—An Economic Aspect," by P. Parrish, A.I.C.; "Briquetting with Smokeless Pulp Binders," by C. J. Goodwin, B.Sc., A.C.G.I., M.Inst.C.E.; and "The Industrial Importance of the Heterogeneous Character of Coal Seams," by F. S. Sinnatt, M.B.E., D.Sc., F.I.C., have been bound into sets in stiff boards, and may be acquired at the price of 10s. 6d. for each set.

JOINT WIPING AND LEAD WORK.*

This book is characterized by its wealth of unusual, practical illustrations, of which there are 116. It is the Third Edition of the work; the former edition having been thoroughly revised and considerably enlarged. It can be recommended as a useful guide and real help to the would-be gasfitter.

The greatest difficulty experienced by the beginner in joint wiping is that of manipulating his tools correctly and securing the proper essential motions of his hands. The author has kept this view in mind throughout; and the illustrations show exactly how these motions should be made. Each motion of the hand or tool is shown in consecutive order of actual practice. The whole forms what might be termed a motion-picture story of the plumber's art.

* "Joint Wiping and Lead Work," by William Hutton. Published by Sir Isaac Pitman & Sons, Ltd. Price, 5s. net.

THE COKE OVEN INDUSTRY OF 1930.*

The Editorial Committee of the Coke Oven Managers' Association are to be congratulated on the production of the 1930 Edition of "The Coke Oven Managers' Year Book." It contains invaluable information on the membership and rules of the Association, and on coke oven plants either in operation or under construction in Great Britain and in eighteen other countries. It includes the transactions of the meetings of the Midland, Northern, and Southern Sections of the Association; model answers to questions set in the City and Guilds of London Institute Examinations in Coke and Bye-products Manufacture, held in April last year; the new British standard specifications for tars for road purposes; formulæ for the flow of gas in pipes; the standard specification of the Shatter Test, which has been published in the "JOURNAL," and also some useful tables relating to the coke oven practice. Altogether it is an admirable publication.

* "The Year Book of the Coke Oven Managers' Association, 1930;" printed, for private circulation only, by Benn Bros., Ltd.

Gas Charges.*

By ALFRED THOMAS, of Wellington.

In view of the interest taken at our last meeting in a discussion of differential prices for gas, and in accordance with your request that a paper should be read on this subject, I submit the following particulars as a basis for consideration and discussion.

As by far most of the members of this district represent undertakings with an output of gas below the 100 million line, it would be appropriate for such a representative to introduce this subject. The writer, however, is handicapped in so far that he cannot give the results of the working of one of the modern forms of price charging, and must briefly submit the experience of other undertakings which have adopted the system, and then consider how far small undertakings can adopt revision of prices with a view to making the terms more attractive to consumers.

GAS CHARGES AT HALIFAX.

Mr. W. B. McLusky, of Halifax, the pioneer of the two-part scale of gas charges, has kindly submitted particulars of his charges as follows:

(1) Fixed charge for manufacturers and householders, 6s. 8d. per quarter for every 20 c.ft. in the hourly demand, approximately 6d. per week. This figure is being reduced to 3d. per week so that if the maximum demand was 100 c.ft. per hour the fixed charge would be 1s. 3d. per week. All the gas supplied bears a commodity charge of 6d. per therm.

(2) Perth Parcel Scheme which in America is known as the block system. For example:

First 6000 c.ft. per quarter	4s. per 1000
Second ,, ,, ,,	3s. ,, ,,
Third ,, ,, ,,	2s. ,, ,,
Average price for 18,000 c.ft. per quarter	3s. ,, ,,

This system is attractive to small consumers who do not want to be bound to pay a fixed charge of 6d. per week.

Mr. McLusky points out that the most remarkable increase is in the smaller households which formerly consumed 12,000 c.ft. to 14,000 c.ft. per annum before the adoption of the two-part tariff. In this way:

Fixed charge	6d. per week
Gas consumed, 1000 c.ft. per week	2s. ,,
Average consumption per annum	52,000 c.ft.

In the words of the originator of the above schemes, "the two-part tariff is the best tariff for the gas consumer," and there is abundant evidence of its success.

You, I have no doubt, are aware of the rateable value scheme introduced by Mr. A. J. Roberts, of Donaghadee, in which the charges are as follows:

	Quota.	Per Quarter. £ s. d.
£5 to £8 valuation	14,000 c.ft. per annum	0 13 1
£8 ,, £15 ,,	18,000 ,, ,,	0 16 3
£15 ,, £20 ,,	25,000 ,, ,,	0 18 9
£20 ,, £25 ,,	30,000 ,, ,,	1 3 7
£25 ,, £35 ,,	35,000 ,, ,,	1 12 10

The charge per quarter in this case is 2s. 11d. per 1000 c.ft. up to the number of thousands supplied according to the valuation of the property. After paying the appropriate amount according to the table, all gas is charged for at the rate of 3s. 4d. per 1000 c.ft. so that the total price received is 6s. 3d. per 1000 c.ft. The originator of this method of charge states that it was adopted as a counter attack against electricity, and it has certainly been successful in reducing the number of transferences from gas to electricity.

It may be considered that the rateable value of any particular house is not in itself any criterion of the expenses to which its occupant puts the gas undertaking. Its chief merit is its simplicity; and in the case of a very small undertaking where the gas charges are, of necessity, high, its value, to my mind, is the amount of success attained.

MORE ATTRACTIVE CHARGES.

Probably all the members here have considered at some time the advisability or otherwise of making the charges for gas more attractive to the consumer, the need for the retention of the lighting load in particular being our chief aim.

Now that electricity supply companies are in many cases abandoning the flat rate charge for current of from 6d. to 1s. per unit to a two-part tariff system of a standing charge *plus* electricity at from ¾d. to 1½d. per unit, the need for revision of gas charges becomes increasingly apparent. If we, as gas suppliers, were in a position to charge (say) 2s. 6d. per therm for the first five therms per quarter, we should be in an analogous position, and could benefit from the introduction of an optional two-part tariff to very much the same extent as electricity supply undertakings benefit to-day.

In my own area, I am anticipating competition by a small electrical grid whose terms are advertised as follows: Fixed charge bases on floor space varying from 11s. to £4 per quarter. Electricity 1½d. per unit. A user of 200 units of electricity per annum pays at the rate of 6½d. per unit.

If we wish to retaliate we may find many difficulties confronting us: Section 56 of our Act of 1904 gives us power to charge for gas supplied, and we are advised by the National Gas Council that in law it is not permissible to make any service charge whatever for any period during which no gas is used, however small the quantity.

Assuming for illustration that the fixed charge was 10s. per quarter, and the commodity charge 6d. per therm, and assume the case of consumer who used during one quarter only four therms, his account for the quarter would be:

Fixed charge	10s.
Four therms at 6d.	2s.
Total	12s.

equivalent to 3s. per therm.

Now section 14 of our Special Order, entitled "Sliding Scale as to price and Dividend," allows the Company to pay a standard dividend on the basic price of 1s. 3·4d. with a variation of 2s. 6d. in respect of each one-fifth of a penny by which the highest price charged exceeds the standard price. It would therefore appear in the existing state of the law to be waste of time for a sliding-scale company to consider the introduction of a two-part tariff.

It would, however, be perfectly legitimate to offer to the ordinary consumers an optional two-part tariff providing that any consumer electing to be charged on this basis did not have to pay for the actual gas consumed at a higher rate per therm than the alternative rate. The best way to handle the problem would be to decide on a fixed charge per quarter and collect money in the following way:

	s.	d.
10 therms at 1s. 3·4d. per therm	12	10 per quarter

and then charge all gas consumed at the lowest economic price, which in my case is 8·5d. per therm.

The incidence of the price of gas to pay a standard dividend of 5 p.ct. on the consolidated stock and maintain the existing discount of 1d. per therm for prompt payment would be as follows:

	s.	d.	
10 therms per quarter, gas charge at	1	3·4	per therm
20 ,, ,, ,, ,, ,,	0	11·9	,,
30 ,, ,, ,, ,, ,,	0	10·8	,,
40 ,, ,, ,, ,, ,,	0	10·2	,,
50 ,, ,, ,, ,, ,,	0	9·8	,,
60 ,, ,, ,, ,, ,,	0	9·7	,,
70 ,, ,, ,, ,, ,,	0	9·4	,,
80 ,, ,, ,, ,, ,,	0	9·3	,,
100 ,, ,, ,, ,, ,,	0	9	,,

This system would conform with section 57 of our Act of 1904, which demands that:

> The Company may if they think fit allow discounts or rebates to consumers of gas in consideration of prompt payment of gas rents not exceeding in any case 10 p.ct., and they may if they think fit allow discounts or rebates to large consumers upon such scale and subject to such conditions and regulations as may be prescribed by special contract in writing between the Company and any of such consumers, provided that all discounts or rebates shall be of equal amount under like circumstances to all consumers; provided also that notice of the effect of this enactment shall be endorsed on every demand note for gas rent.

One of the three methods of slot charging suggested by the Committee on Gas Charges is as follows:

> To set prepayment meters to deliver gas at a price somewhat higher than the present flat rate charged to prepayment customers, and, after a quantity of gas (above the present average consumption) had been paid for at this primary rate, to reduce the rate charged for all additional gas used to a figure only slightly above the rate charged to ordinary customers.

The point at which such reduced charge should commence to operate would vary according to the amount of apparatus supplied by the undertakers. Mr. Porteous (of Ware) gives his experience of this system as follows:

> This two-part tariff arrangement for slots has now been in vogue for two complete years and works smoothly and profitably. The collector assures me there is very little

* Paper before the Southern Association of Gas Engineers and Managers (Western District), May 20.

grousing, much less than previously when a 4½d. rebate per 1000 c.ft. was handed to all and sundry. Then Mrs. Brown taking 5000 per quarter got 1s. 11d. and Mrs. Jones taking 9000 got 3s. 5d., and Mrs. Jones thought she ought to have more. Now Mrs. Brown gets nothing, and Mrs. Jones gets 5s. 8d. Of course, the Mrs. Browns did make a little fuss at first, but changing the single-cased old-fashioned cookers for new double-cased model, and other items placated the ladies, and many of them have increased their consumption so that now, they, too, enjoy the rebate.

This system—so much fairer to the substantial slot consumer—is also much more profitable to the company. Under the old system a small rebate given to everybody gave an average return of round about 8d. per 1000 c.ft. above the general rate. We last dropped our general price as from March 31 of last year to 4s. 7d. per thousand, and for the June quarter the extra net average for slots was 1s. 3·02d. For September it was 1s. 2·36d., and for December 1s. 1·34d. This is a reasonable figure, considering that under the 1920 Gas Regulation Act it is permissible to charge as much as 1s. 6d. per thousand extra.

In my own case a slot installation consists of meter, cooker, and three lights, with accessories; and the slot rate is 14 c.ft. per 1d.—*i.e.*, 5s. 11½d. per 1000 c.ft., *less* 7½d. rebate, which is 5s. 4d. per 1000 c.ft., or 6½d. per 1000 c.ft. above the rate charged to ordinary consumers. Our average consumption per slot consumer is 21,700 c.ft. per annum. This figure has increased since the inauguration of cash discounts. I should certainly hesitate to reduce the amount of gas allowed per coin meter and abolish rebates in respect of the poorer customer who can ill afford to pay more. As a matter of fact there are very few indeed who use less than 15,000 c.ft. per annum.

In most undertakings the capital value of slot installations has automatically reduced to a low figure. In our own case it is 28s., and I believe in time the slot price will be brought into line with the ordinary price of gas, and then the establishment of a two or three part tariff could be applied on equal terms if found desirable.

FREE FIXING OF APPLIANCES.

As most undertakings provide installations free, I would suggest that small undertakings, at any rate, could extend this service by the provision of fixing appliances free of cost to those consumers who could afford to use them. For instance, a consumer who takes more than the average quantity would be entitled to a higher grade cooker than those in general use; and then extend this system very discriminately, treating every customer alike, and provide a gas iron, wash-copper, gas fire, &c., free.

I suggest this system as applicable in my own case, bearing in mind the type of consumer one has to cater for, who has a very low purchasing ability. In more prosperous districts the consumers could be asked to purchase these extras.

I will briefly submit for your consideration Appendix E of the Report of the Committee on Gas Charges, as this particular system is recommended by the National Gas Council and consists of three tariffs.

APPENDIX E OF THE REPORT OF THE COMMITTEE OF GAS CHARGES.

(1) *Four-Part Tariff.*—(*a*) Customer charge. Items controlled by the number of customers. (*b*1) Manufacturing demand charge. Items controlled by or incurred in proportion to the quantity of gas demanded during 24 hours. (*b*2) Distribution demand charge. Items controlled by or incurred theoretically in proportion to the quantity of gas demanded at any moment, but in practice to the quantity demanded during any one hour. (*c*) Commodity charge. Items controlled by the quantity of gas consumed, which cease when consumption ceases, or increase as consumption increases.

(2) *Three-Part Tariff.*—(*a*) Customer charge. Same as in four-part tariff. (*b*) Demand charge, manufacturing and distribution. Demand costs in four-part tariff combined (*b*1 and *b*2). (*c*) Commodity charge. Same as in four-part tariff.

(3) *Two-Part Tariff.*—(1) Service charge. Items controlled mainly by the number of customers, but also by demand costs. Such charges are not uniform for all customers owing to difference of demand (2) Commodity charge. Items controlled mainly by the quantity of gas consumed but partly by demand.

The four-part tariff appears a very formidable system, theoretically perfect; but I should imagine difficult to operate, and in the three-part tariff practically the same data has to be obtained. How could a small undertaking, with its necessarily limited staff, work a system which required (1) manufacturing demand charge—*i.e.*, items controlled by or incurred in proportion to the quantity of gas demanded during 24 hours, and (2) items controlled by or incurred theoretically in proportion to the quantity of gas demanded at any moment, but in practice to the quantity demanded during any one hour.

I have not made any attempt to establish the price of gas on the above basis. I have, however, applied No. 3 (two-part tariff) to my manufacturing costs and have determined that:

(1) Service charge is 35·15 p.ct. of total.
(2) Commodity charge is 64·85 p.ct. of total,

representing the flat rate charge.

(1) Service charge 4·1d. per therm.
(2) Commodity charge 7·4d. per therm.

We are all eagerly awaiting the abolition of statutory enactments which tie our hands in the matter of gas charges. It appears, however, that some time will elapse before we are free of the many legal obstacles. It is gratifying, however, to report that many undertakings are, notwithstanding the obstacles, charging for gas in one of the methods outlined.

Naphthalene?*

By F. W. J. BELTON, Engineer, Christchurch Gas, Coal, and Coke Company, Ltd.

The word naphthalene can scarcely be mentioned without conjuring up visions of all sorts of troubles, and the man with continuous vertical retorts thanks goodness he is not as other men are. But is it inevitable that this trouble should be experienced at works equipped with horizontal retorts unless extraction by oil washing is resorted to?

I stated two years ago that with modern methods of working and efficient condensing and tar extraction plant, the naphthalene in the gas could be less than 3 grains. More extended testing made that figure 3-5 grains at the outlet of the ammonia washing plant. Even this is quite a reasonable figure, and gives no cause for anxiety. However, I will give you first the sequence of events and then the deductions and lessons therefrom.

In the latter end of the summer of 1928 complaints on the district, blocked services, &c., increased considerably, and, in fact, became serious. Tests on the gas going on to the town were made, and one or two modifications made, and still the naphthalene tests were not high enough to account for the trouble experienced. The kerosene spray on the outlet of the station governor appeared to have little effect, although the quantity of oil was increased.

One of the Livesey washers was used for oil washing without reducing the town gas figures. Then a series of parallel tests were instituted at different points—namely,

(1) Outlet of washing plant.
(2) Inlet of purifiers.
(3) Outlet of purifiers.
(4) Town.

* Paper before the Gas Institute of New Zealand.

The results showed that the gas was picking up naphthalene from the purifiers. In fact, the outlet purifier test was often more than double that on the inlet. An oil spray was then introduced at the outlet of the purifiers, and a test put on at the inlet of the gasholder. This test showed that the oil spray was reducing the naphthalene figure on the outlet of the station meter, but that naphthalene was being picked up in the holder.

The oil spray at the outlet of the station meter was then discontinued, and the amount of oil supplied to the Botley plant increased. So that we were then:

(1) Oil washing in Livesey washer.
(2) Spraying on outlet of purifier.
(3) Spraying on outlet of station governors.

The Livesey washer is, of course, inefficient as a naphthalene washer, because all the washing is in one stage, and it is impossible to reduce the naphthalene to zero as an equilibrium is set up between the naphthalene in the gas and in the oil.

In the meantime, a Holmes washer was ordered and put into operation in two sections, one on the outlet from the ammonia washers, and the other (to be eventually used for gas drying) on the outlet of the station meter. Immediately the naphthalene entering the purifiers was reduced to about 0·75 grain, while the figure for the outlet remained almost unaltered (except for weather variations). A similar effect was obtained on the outlet of the station meter, the washer outlet being practically zero, while the town was almost unaltered.

This, of course, was what we expected would happen until the oxide, in the purifiers, and also the gasholder, crown framing, &c., were cleared of naphthalene. From this time on,

the naphthalene decreased until at present the amount in the town gas is less than 1 grain per 100 c.ft.

Now, this appears a simple and straightforward story; and so it is. But there were other factors brought to light which complicated matters, and in some ways made certain tests of little value. For instance, at no time did a test taken over 24 or 48 hours reveal sufficient naphthalene in the town gas to account for the supposed naphthalene troubles that were being experienced on the district.

The explanation apparently is that the test is taken equally over 24 hours, but the gas does not go out in the same way. In our case 75 p.ct. of the gas goes out between 6 a.m. and 6 p.m., so that the gas sample then taken is only one third of the proportion that it is at night; with this vital point coming in, that in the summer during the 12 daylight hours the sun temperature may easily be 150° Fahr., and the gas leaves the holder at 80°-90° Fahr. This means that as the gas leaves the holder during the day hours it might actually contain 18-20 grains of naphthalene for a portion of these hours, and yet, owing to the rapid cooling of the gas during the night, a fairly low 24 hours' figure is obtained.

Absorption.

Eventually an apparatus was designed for the absorption of naphthalene, which allowed a much more rapid stream of gas being passed, but as the apparatus was being used for another purpose, and we then understood the position in regard to the source of the naphthalene, it was not used on the gas at the time.

It appears then that gas going out during the day, carrying for a few hours a high naphthalene content, was cooled down in the mains and especially in the exposed services at night-time, causing blockages by deposition of naphthalene. This effect is accentuated in Christchurch to an unusual degree because a shade temperature of 80°-85° Fahr., and a sun temperature of 130°-150° Fahr., is often followed in 2 or 3 hours by a drop to below 60° Fahr., and sometimes below 50° Fahr.

Now, naphthalene troubles are no new thing in Christchurch; but why was there this sudden outbreak after a period of comparative freedom and immediately following upon the putting to work of new condensing plant, &c.?

With the old condenser the gas was never cooled below 80° Fahr., and often left the condensers nearer 100° Fahr. in temperature. What had happened was that after the overhead purifiers were put to work in 1926 naphthalene, which should have been removed by the condensers, was deposited in these purifiers. Previously this naphthalene had been carried forward through the old covered and partly-buried purifiers, and deposited in station meter and holder connections from which it had to be periodically removed. In the new condensing plant the gas is cooled to 55° Fahr., and contains a corresponding amount of naphthalene. Consequently, when it passed through the purifiers and gasholder at a higher temperature (in summer time) naphthalene was picked up from these points, as shown by our tests. The amount of naphthalene found in the oxide could easily have been deposited, in the time available, from the inadequately condensed gas from the old condensers.

In consequence of these findings, when the " Dri-Gas " plant was installed it was used entirely for oil washing, until the naphthalene re-absorption about the plant had almost ceased, and naphthalene going on the town had been below 1 grain for a considerable time.

The plant was then put to work as a gas-drying plant, and although the naphthalene in the town gas still remained at 1 grain, troubles on the district again increased when hot weather was experienced. This was what I had expected and had indicated was likely to occur for a time after the institution of the gas drying, because the removal of water from the mains would enable old water-logged deposits of naphthalene to become active and be re-absorbed in the gas, and, on cold nights, re-deposited in exposed services.

There is one other point in connection with this matter which was commented upon by Mr. Whitehead, of Portsmouth, in his paper on gas dehydration, and that is the unreliability of the complaint department's analysis of the causes of blockages.

Necessity of Uniform Temperature.

It appears from our experience that in this country after efficient condensation of the gas has been effected, it is a very important point to keep the temperature of the gas, especially in the holder, as uniform as possible, and that means that steps must be taken to reflect the sun's heat from these surfaces and not to absorb it and transmit it to gas inside. This can be accomplished by painting the surfaces with aluminium. There will often be a difference of 50° to 60° Fahr. between the temperatures of two sheets of iron exposed to the sun, one painted red or black, and the other painted with aluminium.

It appears that we shall be liable to spasmodic outbreaks of service troubles until all the old deposits in the district are taken up, as systematic spraying of the street mains with oil would be very expensive with only 24,000 consumers on 270 miles of mains, unless the troubles became localized in certain areas.

There are certain lessons to be learnt from our experiences which may be useful to others. For instance, if the new condensing plant had been installed before the new purifiers, then the oxide in these boxes would not have been charged with naphthalene. In other words, on every works where plant is overloaded, and the ordinary methods of purification are employed, where extensions are undertaken they should be from the condensers forward, towards the holders, and not from the purifiers backwards to the retort house. There are other reasons for this also, and it is equally as important to proceed in this way when the carbonizing plant consists of vertical retorts, because, otherwise, although naphthalene troubles will not be experienced, the oxide will become clogged with light oils, and the ammonia washing will also suffer.

Another lesson is that overhead purifiers must always be adequately protected from the weather and especially from the prevailing cold winds. Also that the ordinary slow, long-period naphthalene test, under present-day conditions of gas consumption, can be very misleading for the reasons given already, and, therefore, the form of apparatus we have found satisfactory is described for your information.

The following tables and tests show how the sources of the naphthalene were located and the effect of the various steps taken to overcome the troubles.

Average of tests, February to April, 1929:

—	Inlet Purifiers.	Town Gas.
Grains of naphthalene per 100 c.ft.	3·58	5·24
Corresponding to naphthalene saturation in "wet" gas at	56° Fahr.	62° Fahr. (Approx.)

Following upon these tests, regular tests were made at different points to find out exactly where the naphthalene was being taken up. Period of tests, one month:

—	Inlet Purifiers.	Outlet Purifiers.	Town Gas.
Grains of naphthalene per 100 c.ft.	2·5	5·85	5·36

During this period our Livesey washer was being used for oil washing, and this accounts for the decrease of 1 grain on the inlet to purifiers.

The washer on outlet of station meter, eventually to be used as " Dri-Gas " washer, was then put to work as an oil washer, and is referred to as No. 2 washer; inlet of No. 2 washer being now the same as outlet to purifiers.

—	Inlet Purifiers.	Inlet No. 2 Washer.	Outlet No. 2 Washer.	Town Gas.
Grains of naphthalene per 100 c.ft.	2·0	3·46	0·28	3·77

From these tests it was evident that after oil washing the gas was picking up naphthalene between washer and town in its passage to and from the gasholder. The main from washer to holder was cleared as much as possible by steaming and washing out with hot water and kerosene, but was not completely cleared. As the following tests will show, naphthalene was also being taken up in the holder:

—	Outlet No. 2 Washer.	Inlet Holder.	Outlet Holder.	Town Gas.
Grains of naphthalene per 100 c.ft.	0·15	1·5	2·55	3·0

The second half washer of the " Dri-Gas " plant was then put to work on the outlet of ammonia washers—*i.e.*, before the purifiers—and the following results obtained:

—	Inlet No. 1 Washer.	Outlet No. 1 Washer.	Inlet No. 2 Washer.	Town Gas.
Grains of naphthalene per 100 c.ft.	4·27	1·7	2·4	2·54

Winter conditions were prevailing at this time, and the gas was being re-saturated after each washer in passing through the purifiers and gasholders. The purifiers at this time had no side sheeting to keep off cold winds.

A further series of tests gave the following results:

—	Inlet No. 1 Washer.	Outlet No. 1 Washer.	Inlet Purifiers.	Inlet No. 2 Washer.	Town Gas.
Grains of napthalene per 100 c.ft.—					
July	3·6	0·65	0·3	1·5	1·5
August	..	0·65	..	2·2	1·14

The second and third figures can be taken as indicating the same amount of naphthalene, as complete accuracy at this low concentration is almost impossible.

This condition continued with the naphthalene content of the town gas gradually diminishing to about 1 grain, and the work's gas at inlet to No. 2 washer down to about 2·5 grains. At the same time there was a very satisfactory decrease in the number of complaints. The "Dri-Gas" washer (No. 2) was then put into operation with the calcium-chloride solution.

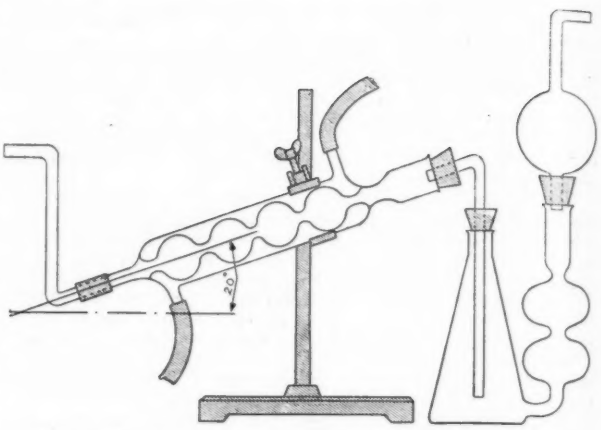
Now it is only a matter of time and the gradual absorption of the old deposits in street mains before we obtain complete freedom from these complaints.

Tests on the oxide in the purifiers indicated over 0·5 p.ct. of naphthalene, and as the absorption from the purifiers during the summer time had been going on for some months before we tested the oxide, originally the figure must have been higher. The special apparatus shown has been tested against the ordinary apparatus for naphthalene testing and gives very reliable results, and it is intended to make some tests on very hot days on the town gas to find out what is the increase in naphthalene content at mid-day; although now that the holders are practically clean of naphthalene, no startling results are expected. Our only regret is that we did not devise this apparatus in time for use last summer.

The oil used for washing is a heavy fuel oil and this oil, after having the absorbed benzole distilled off, is re-sold.

The following table shows the average amounts of naphthalene in the oil in the different chambers of the washer:

Chamber No.	P.Ct. of Naphthalene.
1	6
2	5·71
3	4·9
4	3·3
5	1·06
6	0·1 to 0



RAPID METHOD FOR THE DETERMINATION OF NAPHTHALENE IN GAS.

Apparatus: As shown in sketch.

Exposed rubber is avoided up to the meter by making glass to glass joints. The condenser is placed at an angle of 20° to the horizontal, and $\frac{N}{20}$ picric acid sufficient to fill the first three bulbs is added. The wash bottle contained a small amount of picric acid to act as a catch. Gas is passed at the rate of up to 5 c.ft. per hour. The test is stopped before any precipitate forms in the wash bottle. Water is passed through the condenser if the gas is above 75° Fahr.

When sufficient gas has passed, the tubes are washed out with $\frac{N}{20}$ picric acid, and the precipitate is filtered off.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The Select Committee met to consider the Brighton and Hove Gas Bill on Tuesday.

Special Orders.

The Special Orders Committee met to consider the Exmouth Gas (No. 2) Order, and the Wandsworth, Wimbledon, and Epsom District Gas Order on Tuesday.

House of Commons.

Private Bills.

The South Yorkshire and Derbyshire Gas Bill has been read a third time, and passed.

The Ascot District Gas and Electricity Bill has been read a second time, and referred to a Committee. A petition against the Bill has been presented by the London and Home Counties Joint Electricity Authority.

The Brixham Gas and Electricity Bill has been read a second time and referred to the Committee on Unopposed Bills.

Special Orders.

The Exmouth (No. 2) Gas Order and the Wandsworth, Wimbledon, and Epsom District Gas Order have been approved, subject to the omission of the words "such fractional part of one pound of" from Clause 12 of the Wandsworth Order.

Plans have been deposited in connection with the Sheppey and Cheltenham Gas Orders.

Unemployment Grants.

Assessment for Income-Tax Purposes.

Mr. E. BROWN (L., Leith) asked the Chancellor of the Exchequer if he was aware that the Inland Revenue authorities were assessing local authorities in Scotland which had been receiving unemployment grants for revenue-producing undertakings for income-tax on the amount of these grants; and that this resulted in the Government taking back 4s. in the £ for every £1 of grant received; and whether any warning was given when the grants were offered that such assessments would be made.

Mr. SNOWDEN: The grants referred to in the question are included in assessments on local authorities on the ground that they are receipts of a revenue nature, and, as such, are liable to tax under the general provisions of the income-tax law. The liability in such cases was confirmed by the High Court on April 30 last in the case of the *Seaham Harbour Dock Company v. Crook*.

Mr. BROWN: Has the Chancellor any statement to make about Government policy on the matter, and was any warning given when the grants were offered?

Mr. SNOWDEN: In regard to the first part, I certainly cannot at present deal with this matter; nor do I think there is any justification for it. As to whether any warning was given, it is no part of the duty of the Revenue authorities or the Government to give instructions as to how in a particular case a party will be affected by income-tax law; but the Revenue authorities are always ready to give information when any specific question is addressed to them, and it was quite clear that the local authorities were aware of their liability under the law in regard to this matter.

Mr. BROWN: Is the Chancellor not aware that the only difference in the scale of grant given by the present Government over that of the previous Government was on this very point of revenue, and that this has not been done before? Does he not realize that the increase promised by the late Lord Privy Seal is more than taken away by the demand for income-tax?

Mr. SNOWDEN: It does not follow that I accept the interpretation of the hon. member. It is quite true there was some ambiguity about it, and the case in the courts was decided last April.

Legal Intelligence.

European Gas Company.

In the Chancery Division, on Monday, Mr. Justice Bennett granted the petition of the European Gas Company, Ltd., of Montague House, Devonshire Square, E.C., for permission to alter the objects of the Company, and substitute memorandum and articles for a deed of settlement.

Mr. A. Utthwatt (instructed by Parker, Garrett, & Co.) appeared for the Company, and explained that the concern supplied gas to 34 towns and provinces in France and elsewhere on the Continent. Its business was carried out exclusively abroad. The Company was formed in 1835, and was registered under the Joint Stock Companies Act of 1856 and 1857. It was now desired to adopt a memorandum and articles to take the place of the old deed of settlement and to increase the Company's objects. Hitherto, it had the right to manufacture and supply gas and deal with residuals. Now it was desired also to manufacture and supply electricity and certain classes of apparatus for heating, light, and power, and do other things that have been the subject of notices and advertisements widely issued. The capital of the Company was £1,002,180 in £10 shares.

As stated, his Lordship sanctioned the scheme and granted the petition.

Register of Patents.

Tar Distillation.—No. 309,946.

THE BARRETT COMPANY, of New York (Assignees of MILLER, S. P., of Tenafly).

No. 5240; Feb. 16, 1929. Convention date, April 18, 1928.

The following are among the claims put forward for this invention:

1. The method of operating retort gas plants and of distilling tar to produce pitch and distillate oils therefrom, which comprises passing the gases from a plurality of coal distillation retorts directly into a single standpipe, bringing tar or pitch to be distilled into intimate contact with the gases in the standpipes, whereby to wash the walls of the standpipes, and regulating the amount of tar and avoiding the dissipation of heat from the gases to bring about effective distillation of the tar by the gases by insulation of the standpipes, withdrawing the pitch produced by the distillation from the standpipes, and withdrawing the resulting gases and vapours while still at a high temperature from the standpipes, and cooling the same to condense oils therefrom.

2. Process of claim 1 according to which the partly distilled tar or pitch resulting from the distillation is recirculated and again brought into intimate contact with the hot gases in the standpipes, to effect further distillation and the production of a pitch of higher melting-point and an increased distillation of higher boiling-point oils.

3. Process of claim 1 according to which the gases after leaving the standpipe are subjected to a cleaning treatment before entering the condensers.

4. Process of claim 1 according to which coke oven tar is introduced into the standpipes and distilled by the hot retort gases.

5. The process of claim 1 in which water-containing tar is brought into intimate contact with the gases to effect its dehydration and in which the dehydrated tar is then subjected to distillation in the standpipes for the production of a pitch residue and distillate oils therefrom.

6. The method of operating retort gas plants and of distilling tar to produce pitch and distillate oils therefrom, as claimed in claim 1, which comprises combining the gases from different groups of retorts in standpipes, cooling the gases in the standpipes by the introduction of cooling liquids, and collecting tar from the cooled gases and bringing the collected tar into intimate contact with hot gases from other retorts in another standpipe.

Gas Meters.—No. 314,328.

ROOTS COMPANY, P. H. & F. M., of Connersville (Assignees of OWENS, R. H., of Connersville).

No. 8937; March 19, 1929. Convention date, June 25, 1928.

This invention relates to fluid-handling apparatus, and more particularly to apparatus of this character embodying a pair of intermeshing fluid displacement members adapted to be operated in timed relationship. One object of the invention is the provision of an apparatus of this character having timing gears at only one end of the meter, the timing gears being of such character as to permit clearance adjustments in the meshing gears and adjustments in the timed relationship of the intermeshing displacement members. Another object of the invention is the provision of fluid-handling apparatus having a fixed and an adjustable timing gear at one end of each rotor shaft, the fixed timing gear of each shaft meshing with the adjustable timing gear of the other shaft. Another object of the invention is the provision of means for efficiently lubricating the timing gears.

Cooker Plate-Racks.—No. 328,158.

BAKER, B. H., of Wollescote.

No. 19,081; June 21, 1929.

This invention has for its object to provide a plate-rack which can readily be mounted over any ordinary gas cooker.

The invention comprises the employment at the lower end of each of the vertical members which support the rack of a clamp adapted to fit over and under the upper and lower sides of the rear or other appropriate edge of the hotplate, and the provision in both the upper and lower members of the clamp of screw holes which are not placed opposite each other, and are able to accommodate clamping screws which can be placed in positions best suited to give the most secure clamping action.

Distance Control of Gas Lights.—No. 328,204.

HORSTMANN, B. G., HORSTMANN, J. H. G., and HORSTMANN, F. O., all of Bath.

No. 1747; Jan. 18, 1929.

The object of this invention is to provide a means other than pneumatic whereby gas burners may be operated mechanically at a distance. A further object is to provide means to control the burners in a gradual manner so as to lower the gas without extinguishing it, and to regulate the valves to any required flow of gas and consequent degree of illumination. A further object is to provide that a group of burners may be lighted when the control lever is operated to the full "on" position, and on moving the said lever towards the "off" position, one or more of the burners are extinguished, leaving one or more burners still alight; and, by further moving the said lever knob or the like to the extreme "off" position the lights are all extinguished.

Grillers.—No. 328,474.

GENERAL GAS APPLIANCES, LTD., of Manchester, and FRANCIS, W. R., of Churnal, Derbyshire.

No. 15,806; May 22, 1929.

This invention refers to deflector plates for gas cookers or grillers. The object is a construction of deflector plate, which becomes more uniformly heated, and retains the heat more effectively, and thus permits of the more economical use of the gas. The deflector plate, which is of the kind composed of two thicknesses of metal lying one over the other, is characterized by a series of depending fin-like projections at or near the rear edge and upon the underside of the plate, the projections being of **V**-shape in cross-section and having a contour similar to that of one of the teeth of a ratchet wheel. The plate is further characterized by each thickness being formed with parallel and spaced bars longitudinal and transverse, which collectively produce a reticulated or "honeycomb" pattern. The longitudinal bars of one thickness lie in the spaces between the longitudinal bars of the other thickness, while the transverse bars lie on the outer (upper and lower) faces of the plate.

The patentees claim that the fin-like projections and the cross-bars which lie at small and equal distances apart allow of the plate being more evenly heated than heretofore; that part of the plate farthest from the gas jets being as hot (or nearly so) as the part next the gas jets.

Recovery of Gas Tar from Emulsions. No. 328,516.

RIPLEY, R. R., and SCHWARZ, S. C., both of Portland, Oregon.

No. 23,226; July 29, 1929.

The following claims are put forward for this invention:

1. In the process for the recovery of tars from their aqueous emulsions, the steps which consist in adding to the emulsion a relatively small proportion of a demulsifying agent; rapidly heating the mixture to boiling under atmospheric pressure, thereby to reduce the viscosity of the commixture and promote the intimate intermixture of its ingredients; then continuing the heating to a higher temperature under increasing pressure, thus not permitting vaporization, and below a point at which the tar would be materially altered by distillation or cracking, thereby to induce the coalescence of water particles; then continuing the latter temperature until coalescence of the particles manifests itself; and finally discontinuing the heating and gradually relieving said pressure, whereby to induce quiescence to permit an undisturbed separation of the tar by gravity into a distinct stratum facilitating its withdrawal.

2. In the process of claim 1 the use of the demulsifying agent in the form of a solution.

3. The process of claim 1 or 2 wherein the higher temperature to which the heating is carried does not exceed approximately 320° Fahr.

Water Gas Generators.—No. 328,642.

TYRER, D., of Norton-on-Tees, and IMPERIAL CHEMICAL INDUSTRIES, LTD., of Westminster, S.W. 1.

No. 2564; Jan. 25, 1929.

This invention relates to improvements in water gas generators, and has for its object to provide a deep bed of coke, and thereby to increase the capacity of the generator without excessive formation of carbon monoxide in the blast gases. The blasting air is admitted to a deep coke bed at a number of points situated at different depths in the bed. For example, the air may be introduced through tuyeres suitably arranged.

The invention includes the combination of the supply of air at various predetermined depths to a bed of coke with the alternate supply of steam to traverse the whole of the coke bed in a direction which is either the same or opposite to that of the air combustion gases.

No. 328,643.

TYRER, D., and CARTER, D. H., both of Norton-on-Tees, and IMPERIAL CHEMICAL INDUSTRIES, LTD., of Westminster, S.W. 1.

No. 2565; Jan. 25, 1929.

A combustion chamber for the blow gases is provided, and so disposed as to return to the coke contained in the generator by conduction a substantial quantity of the heat produced by their combustion. The invention permits of running the "blow" to produce more carbon monoxide without the necessity of having to provide an increase in the amount of steam required to carry back the heat when a regenerator is employed. The combustion chamber surrounds, and is separated by a thin wall from, a deep bed of coke.

The blow gases pass downwards through the bed of coke and enter the combustion chamber at its lower end, leaving it at its upper end. The steam during the "make" periods takes the opposite course after being pre-heated in a regenerator.

Apparatus for Cooling Coke.—No. 328,887.

HUMPHREYS & GLASGOW, LTD., of 38, Victoria Street, S.W. 1 (Assignees of BOSLER, W. T., of Philadelphia).

No. 25,722; Aug. 23, 1929. Convention date, Oct. 4, 1928.

This invention relates to the cooling of hot coke from retorts or ovens with the recovery of a large part of its sensible heat.

Fig. 1 is a vertical longitudinal section of a form of the apparatus chosen for illustration; while fig. 2 is a transverse vertical section along the line A—A in fig. 1.

Referring to the diagrams, 1 generally indicates a closed casing provided with refractory and heat insulating lining 2, and enclosing an inclined, perforated wharf 3, which is positioned above the bottom of the casing so as to provide a space or chamber 4 beneath the wharf. The wharf is preferably made up of under-lapping plates 5, having interstices between them forming passages leading from the space below the wharf to that above.

The casing at the high end of the wharf is provided with a charging opening 6 having gas-tight closure 7, which in the apparatus shown is water sealed. The casing is also provided at the low end of the wharf with a discharge opening 8 with the gas-tight door or gate 9. Within the casing, partitions 10 extend from the sides of the wharf to the top of the casing and form, between the partitions and the casing, flues 11 which communicate with the chamber 4 below the wharf.

Fig. 1.

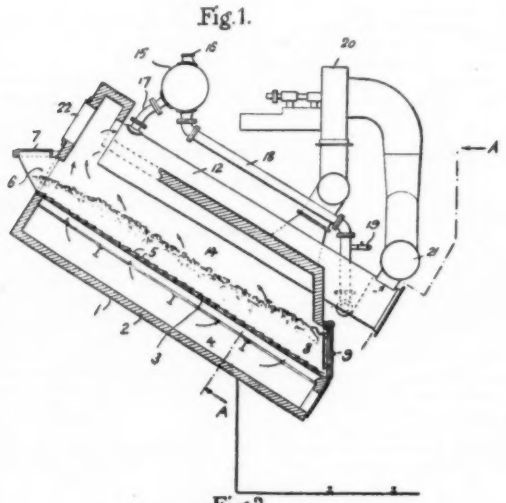
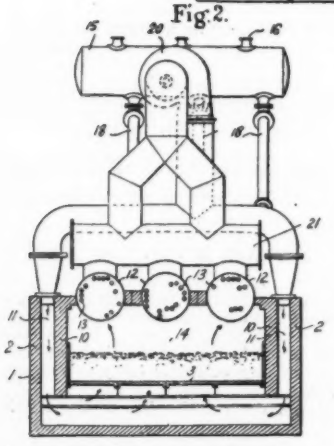


Fig. 2.



Coke Cooling Apparatus.

The casing partially encloses a firetube boiler or boilers; and in the apparatus chosen for illustration there are three firetube boiler shells 12, their firetubes 13 communicating with the space 14 above the wharf and between the partitions 10. The boiler shells are provided with a steam drum 15 and the necessary steam offtakes 16, as well as water circulating connections 17 and 18, and feed water inlet 19. A fan 20 is provided, the inlet side of which is connected to the firetubes of the boilers, as shown through the header 21, and the pressure side of which is connected to the flues 11 within the casing. Doors as 22 are provided to allow access to the boilers for cleaning or for removing and replacing tubes or other repairs. The boiler shells and the wharf are inclined in the same direction with respect to the horizontal and in confronting relation.

In operation, a charge of hot coke is admitted through the opening 6, the door 9 being closed. The angle of inclination of the wharf is such that the coke slides down over it gently without breakage, and the charge distributes itself in a quiescent layer over the wharf. The opening 6 is closed, and the air within the apparatus is circulated and re-circulated by the fan, through the wharf, coke, and the firetubes 13 of the boiler. After one or two passages through the coke the air is spent by combustion of a small amount of coke, and the further circulation is of these products which are inert to the coke.

The re-circulation is carried on until the coke has reached the desired temperature for discharge. The coke is also cooled at the same time by direct radiation to the bottom portions of the boiler shells, which form large heat absorbing surfaces. The combination of the cooling by the forced re-circulation of the gas, and the cooling by direct radiation, results in a very short time being necessary for the cooling operation and a large capacity for the apparatus.

When the coke has been cooled to the desired temperature, the circulation of gas is terminated, the door 9 is opened, and the batch of coke slides gently down off the wharf and out of the apparatus.

Carburetted Water Gas.—No. 329,245.

HUMPHREYS & GLASGOW, LTD., of 38, Victoria Street, Westminster (Assignees of TERZIAN, H. G., of Philadelphia).

No. 27,624; Sept. 11, 1929. Convention date, Nov. 8, 1928.

According to this invention, the oil is admitted simultaneously to at least two of the vessels of the set—generator, carburettor, and superheater—wherein it is vaporized, and the resultant vapours and oil gas are passed through the generator fuel bed and cracked therein. Thus the burden of vaporizing and partially cracking the oil is divided between the vessels, and, state the patentees, proper distribution of temperatures and balanced operation secured.

Dry Gas Meters.—No. 329,475.

THORP, F., BUTTERWORTH, E., and PARKINSON & COWAN (GAS METERS), LTD., all of Kennington Road, S.E. 11.

No. 11,891; April 17, 1929.

In accordance with this invention, the meter casing comprises two cylindrical pan-like parts, one of which may be open at both ends, while the other is open at one end only. The pans are secured together, and each has a peripheral bead or groove formed therein into which the edge of the diaphragm (which is extended over a metal ring) is sprung. By springing the edge of the diaphragm directly into the meter case, a large diaphragm can be employed, giving a meter of large capacity for its size.

Each diaphragm centre is carried by a pivotally mounted horizontal arm, and each diaphragm operates an arm suspended from bearings in the case. One end of each arm projects through the case at one side of the meter, the ends having interconnected cranks thereon which actuate a common crank shaft extending across the meter and reciprocating the usual gas distribution valves. The gas passages to the diaphragm compartments are formed by tubes extending from the compartments to a platform upon which the valves ride. The underside of the platform constitutes a space open to the gas outlet, while the upper side of the platform is open to the gas inlet pressure. The crank shaft operates the index mechanism.

The cover which encloses the valve mechanism and the gas inlet space is a one-piece pressing with the gas inlet and outlet branches thereon. The diaphragm spaces are closed by detachable caps or cover pieces, which when removed allow of the examination and removal of the diaphragms.

Applications for Patents.

[Extracted from the "Official Journal" for June 5.]

Nos. 16,083—16,928.

BRILL, A. P.—"Automatic gas cut-offs." No. 16,787.

CESKOSLOVENSKA ZBROJOVKA AKCIOVA SPOLECNOST v. BRNE.—"Gas-pressure loader." No. 16,677.

GAS LIGHT & COKE COMPANY.—"Clinometric apparatus." No. 16,657.

HOLEK, E.—See Ceskoslovenska Zbrojovka Akciova Spolecnost v. Brne. No. 16,677.

MACDONALD, J. A.—"Gas producers." No. 16,134.

RUUD MANUFACTURING COMPANY, LTD.—See Brill, A. P. No. 16,787.

RYND, C. LA T.—"Gas-saving attachment for geysers." No. 16,536.

STOREY, R. (STOREY FOUNDRY COMPANY, LTD.).—"Atmospheric gas burners." No. 16,871.

[Extracted from the "Official Journal" for June 12.]

Nos. 16,929—17,756.

GROVES, W. W.—"Dry gas meters." Nos. 17,248, 17,255.

HUMPHREYS & GLASGOW, LTD.—"Manufacture of carburetted water gas." No. 17,583.

PINTSCH AKT.-GES., J.—"Gas meters." No. 17,048.

PINTSCH AKT.-GES., J.—See Groves, W. W. Nos. 17,248, 17,255.

PINTSCH AKT.-GES., J.—"Double valves for dry gas meters." No. 17,446.

PINTSCH AKT.-GES., J.—"Gas meter control means." No. 17,045.

PINTSCH AKT.-GES., J.—"Dry gas meters." No. 17,196.

SOUTH METROPOLITAN GAS COMPANY.—"Coin-freed apparatus for meters." No. 17,544.

TRIGGS, W. W.—See Pintsch Akt.-Ges., J. No. 17,446.

WADE, H.—See Pintsch Akt.-Ges., J. No. 17,048.

WOODALL-DUCKHAM (1920), LTD.—"Reverberatory furnaces, &c." No. 17,594.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. June 20.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 6	5	5	Aldershot 5 p.c. max. C. .	73–78	..	..
522,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	70–73	..	71
1,551,868	,,	Apl. 3	7½	7½	Alliance & Dublin Ord. . .	93–96	–1	94–95
374,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb. . . .	60–63	..	..
522,655	,,	Mar. 6	7	7	Barnet Ord. 7 p.c.	109–112	..	110½–111½
300,000	1	Apl. 24	1/4½	1/7½	Bombay, Ltd.	16/6–18/6	..	16/6
174,500	10	Mar. 6	9	9	Bournemouth 5 p.c. . . .	14–15	..	..
500,050	10	,,	7	7	Do. B 7 p.c. . .	12¾–12¾	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c. .	10¾–11¼	..	..
50,000	Stk.	Dec. 19	3	3	Do. 3 p.c. Deb. .	55–58	..	..
162,025	,,	,,	4	4	Do. 4 p.c Deb. .	74–77	..	..
357,900	,,	Mar. 20	7½	7½	Brighton & Hove 6 p.c. Con	114–117	..	..
971,880	,,	,,	6¾	6¾	Do. 5 p.c. Con.	102–105	..	..
1,287,500	,,	Feb. 20	5	5	Bristol 5 p.c. max.	89–90a	..	..
855,000	,,	Apl. 3	7	8	British Ord.	110–115	..	115
100,000	,,	Dec. 19	7	7	Do. 7 p.c. Pref.	115–120	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. . .	72–75	..	72½
450 000	,,	,,	5	5	Do. 5 p c. Red. Deb. . .	92–95	..	..
100,000	,,	Jan. 9	5	5	Cambridge 5 p.c. Deb. . .	94–97	..	..
100,000	10	May 22	6	10	Cape Town, Ltd	9–10	..	..
100.000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. . .	6¼–7¼	..	..
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. . .	71–76	..	..
626,860	,,	Feb. 20	6	6	Cardiff Con. Ord.	96–99	..	..
237 860	,,	Jan. 9	7½	7½	Do. 7½ p.c. Red. Deb. .	98–101	..	..
157,150	,,	Feb. 20	5	6¾	Chester 5 p.c Ord.	88–93b	..	..
98 936	1	May 8	†2/-	†2/-	Colombo, Ltd. Ord. . . .	33/–34/-	..	..
24 500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. .	1/6–2/6	..	..
375,402	1	Apl. 3	1/9½	1/9½	Colonial Gas Assn. Ld. Ord	18/–20/-	–2/-	18/9–19/-
187,848	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/–21/-	..	..
2,073,280	Stk.	Feb. 20	5	7	Commercial Ord.	90–93	..	92
475,000	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	57–60	..	58½
787,500	,,	Feb. 20	7	7	Croydon sliding scale . .	105–108	..	106–107
453,100	,,	,,	5	5	Do. max. div. . . .	83–86	..	..
542 270	,,	Mar. 6	7	10	Derby Con.	115–125e	..	..
55,000	,,	Dec. 19	4	4	Do. Deb.	67–70e	..	..
209 000	,,	Mar. 6	5	5	East Hull Ord. 5 p.c. . . .	71–73	..	..
1,002,180	10	Mar. 20	†4	†7	European, Ltd.	12–13	–¼	12–12½
18,629,125	Stk.	Feb. 20	5⅞	5⅞	Gas Light & Coke 4 p.c. Ord.	18/9–19/3/	..	18/9–19/1½
2,600,000	,,	,,	3⅝	3⅝	Do. 3½ p.c. max. . . .	6¾–6½	..	64–64½
4,157 020	,,	,,	4	4	Do. 4 p c. Con. Pref. . .	77–80	..	77–78
5 602,620	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb. . .	59–62	..	60–60½
2,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. . .	99–102	..	99¾
161,400	,,	Feb. 20	10	10	Harrogate Cons. 10 p c. max.	158–163	..	..
82,500	,,	Mar. 20	7	7	Hastings & St. L. 5 p.c. Conv.	96–101	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	78–83	..	..
70,600	10	May 22	†10	§	Hongkong & China, Ltd. .	13½–14½	..	..
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 3½ p c. . . .	90–93	..	..
2,438,594	,,	May 22	10	25	Imperial Continental Cap. .	340–360	–10	345–361
223,130	,,	Feb. 6	3¼	3½	Do. 3½ p.c. Red. Deb.	80–85	..	82
235,242	,,	Mar. 20	8½	8½	Lea Bridge 5 p.c. Ord. . .	123–128	..	..
2,145,907	,,	Feb. 20	6	6	Liverpool 5 p.c. Ord. . . .	91½–94½b	..	..
600.000	,,	Mar. 20	7	7	Do. 7 p.c. Red Pref..	101–102b	..	..
165,736	,,	Feb. 20	9	8	Maidstone 5 p.c. Cap. . .	119–124	..	..
63,480	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	52–55	..	..
75,000	5	Dec. 5	†10	†10	Malta & Mediterranean . .	5¾–6½	+½	..
392,000	—	Apl. 1	5½	5½	Metrop'itan (of Melbourne) 5½ p.c. Red. Deb. . . .	90–93	..	..
541,920	Stk.	May 22	†6	†8	Montevideo, Ltd.	107–112	..	107–108¾
2,061,315	,,	Feb. 20	5	5⅜	Newcastle & Gateshead Con.	16/3–16/9d	..	..
682.856	,,	,,	4	4	Do. 4 p.c. Pref. .	71½–72½d	+1½	..
691,705	,,	Dec. 19	3½	3½	Do. 3½ p.c. Deb. .	66¾–67¾d	..	..
169,940	,,	Mar. 6	7⅛	7⅛	North Middlesex 6 p.c. Con.	109–114	..	..
396,160	,,	Feb. 6	5	5	Northampton 5 p.c. max. .	75–78	..	..
300,000	,,	Apl. 24	9	7	Oriental, Ltd.	108–113	..	111½
60,000	5	13 My., '15	—	—	Ottoman	0–½	..	..
205,162	Stk.	Jan. 9	8	8	Plym'th & Stonehouse 5 p.c.	107 110	..	..
424,416	,,	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std	110–115	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max. . .	78–81	..	..
186,000	100	June 2	4	4	Primitiva 4 p.c. Red. Deb. .	94–97*	..	..
677,837	Stk.	Jan. 23	4	4	Do. 4 p.c. Red. Deb. 1911	81–84	..	..
371.496	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb. .	81–84	..	82¾–83½
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref. . .	8½–9	..	..
1,736.968	Stk.	Mar. 20	6½	6½	Sheffield Cons.	103–105e	..	..
95,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	76–78e	..	..
90,000	10	June 5	‡4	‡7	South African	4–6*	..	..
6.709.895	Stk.	Feb. 20	5	7½	South Met. Ord.	102–104	..	102½–103½
500,000	,,	,,	6	6	Do. 6 p.c Irred. Pf.	108–111	..	108½
1,895.445	,,	Jan. 9	3	3	Do. 3 p.c. Deb. . .	58–61	..	59½–60½
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	99–101	..	100½
91,500	,,	Mar. 20	8½	8½	South Shields Con. . . .	106½–107½d	..	..
1,548,795	,,	Feb. 20	6½	6½	South Suburban Ord. 5 p.c.	101–104	..	..
468,837	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	95–98	..	9⅞
647,740	,,	Feb. 20	5	5	Southampton Ord. 5 p.c. max.	76–79	..	..
121,275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	72–75	..	..
179,014	,,	Feb. 20	8	8	Sutton Ord.	113–116	..	..
67,828	,,	Jan. 9	5	5	Do. 5 p.c. Deb. . . .	93–96	..	98
250,000	,,	Mar. 6	7	7	Swansea 7 p.c. Red. Pref. .	98–100	..	..
200,000	,,	Dec. 19	6¼	6¼	Do. 6¼ p.c. Red. Deb. .	99–101	..	..
1,076,490	,,	Mar. 6	6⅝	6⅝	Tottenham District Ord. .	102 106	..	103¾–104
150,000	,,	,,	5⅛	5⅛	Do. 5⅛ p.c. Pref. . .	97–100	..	..
199,005	,,	Dec. 5	4	4	Do. 4 p.c. Deb. . .	73–76	..	..
182,380	10	30 Dec., '12	—	—	Tuscan, Ltd.	3¾–4¾	..	..
85,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	75–80	..	..
309,094	,,	Mar. 6	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94–99	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref. . .	85–90	..	..
1,180,970	,,	—	—	—	Wandsworth, Wimbledon, and Epsom Cons. . .	108–113	..	111–111¾
200,000	,,	Feb. 20	5	5	Do. 5 p.c. Pref.	87–92	..	..
488,344	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	95–98	..	..

Quotations at:—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Div=10 p.ct. p.a. less tax and less tax on interim dividend.

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NEW ISSUE OF CAPITAL.

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(Incorporated 1818.)

Messrs. A. & W. RICHARDS

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With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

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Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

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THE CHAIRMAN,

SCHOOL FOR THE BLIND

(Founded 1838),

Swiss Cottage, LONDON, N.W. 3

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Engineer and Manager.

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By order of the Board,
F. J. BRADFIELD,
General Manager and Secretary.

Offices,
Stepney, E. 1.
June 24, 1930.

CONTRACTS OPEN.

BOROUGH OF NEWCASTLE-UNDER-LYME.
(GAS DEPARTMENT)

TENDER FOR GAS FUEL.

THE Gas Committee invite Tenders for the Supply of GAS FUEL.

Particulars as to quantities, terms of delivery, &c., from the undersigned.

FRANK L. WIMHURST, M.Inst.Gas E.,
Manager.

Gas-Works,
Newcastle,
Staffs.,
June 20, 1930.

COWES URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

THE above Council invite Tenders for the Supply of 5000 Tons of UNSCREENED GAS COAL delivered in suitable vessels alongside their Jetty in the River Medina, Cowes, over a period of Twelve Months from the 1st of October, 1930, to the 1st of October, 1931.

Forms of Tender may be had from the undersigned.

The sealed Tenders, endorsed "Tenders for Gas Coal," are to be addressed to "The Chairman of the Gas Committee," Gas-Works, Arctic Road, Cowes, and delivered not later than July 11, 1930.

The Council do not bind themselves to accept the lowest or any Tender.

R. A. GRETTON,
Engineer and Manager.

Gas-Works,
Cowes.

HAVERHILL URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Gas Committee are prepared to receive TENDERS for about 1700 Tons of SCREENED GAS COAL or LARGE WASHED NUTS, to be delivered in such quantities as may be required at Haverhill (London and North-Eastern Railway) Station during a period of Twelve Months from the 1st of August, 1930.

The Committee do not bind themselves to accept the lowest or any Tender, and reserve the right to divide any Offer as they may decide.

No special Form of Tender is issued, and Tenders are to be in my hands not later than the 12th of July, 1930.

Envelopes to be marked "Tenders for Coal."

JAMES BEASLEY,
Clerk to the Council.

Council Offices,
Haverhill,
Suffolk,
June 21, 1930.

LOUGHBOROUGH CORPORATION.
(GAS DEPARTMENT.)

TENDER FOR TAR AND AMMONIACAL LIQUOR.

THE Gas Committee of the Lough- borough Corporation invite TENDERS for the PURCHASE of the SURPLUS TAR and AMMONIACAL LIQUOR made at their Works during the Twelve Months from the 1st of July, 1930, to the 30th of June, 1931.

Estimated amount of Tar, 700 Tons; Liquor, 1700 Tons.

The Contractor to state price for Liquor at 5° Twaddel and per ton extra for every ½° above 5°.

The Corporation to deliver both Tar and Liquor either into Contractor's Boats at Canal Wharf or into Contractor's Tanks at the L.M. & S. Nottingham Road Station, L.M. & S. Derby Road Station, or L. & N.E. Station, Loughborough.

Tenders to be endorsed "Tenders for Tar and Liquor," and addressed to H. Perkins, Esq., Town Clerk, Town Hall, Loughborough, not later than Wednesday, July 16 next.

The Committee do not bind themselves to accept the highest or any Tender.

EDWARD ONIONS,
Engineer and Manager.

Loughborough,
June 21, 1930.

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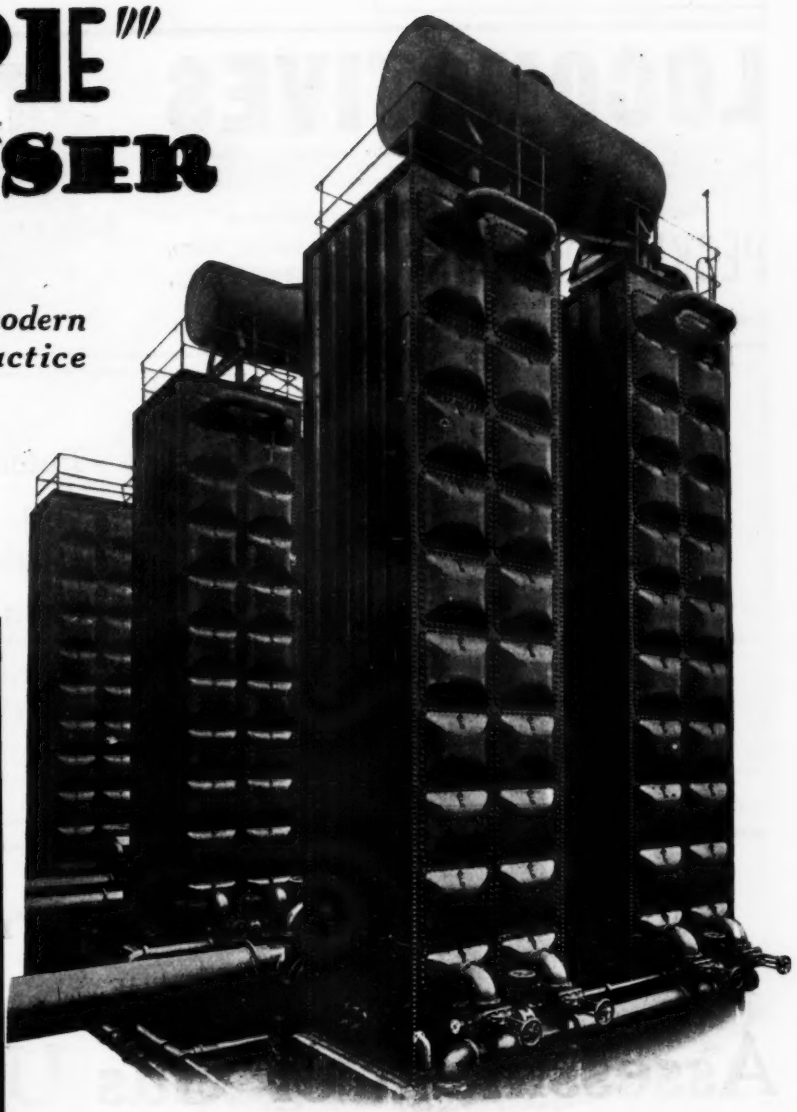

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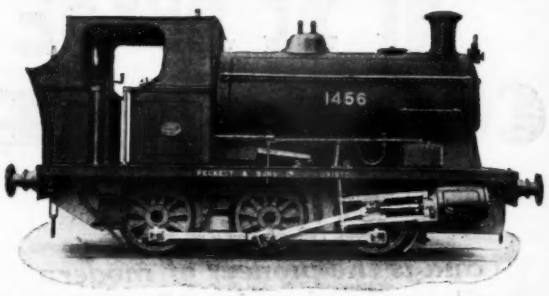

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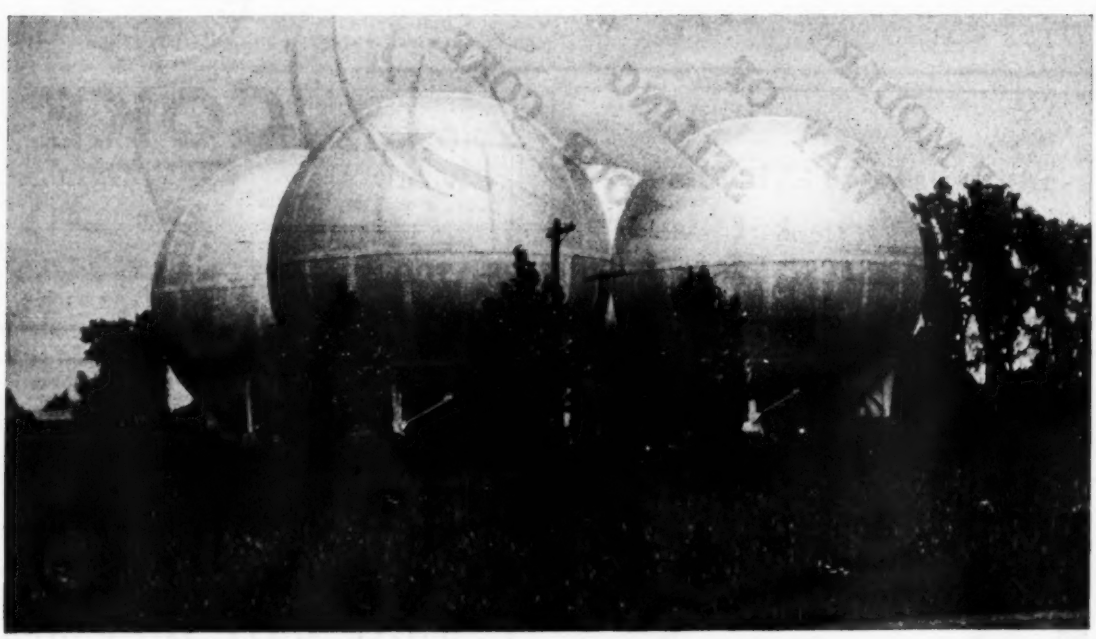

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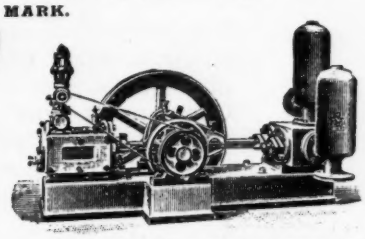

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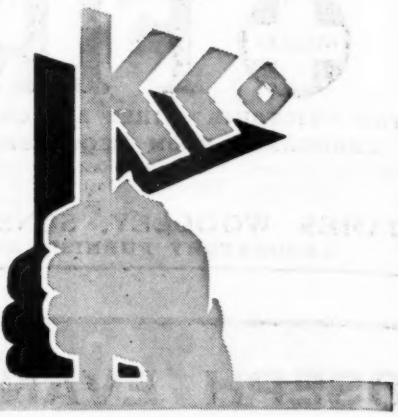

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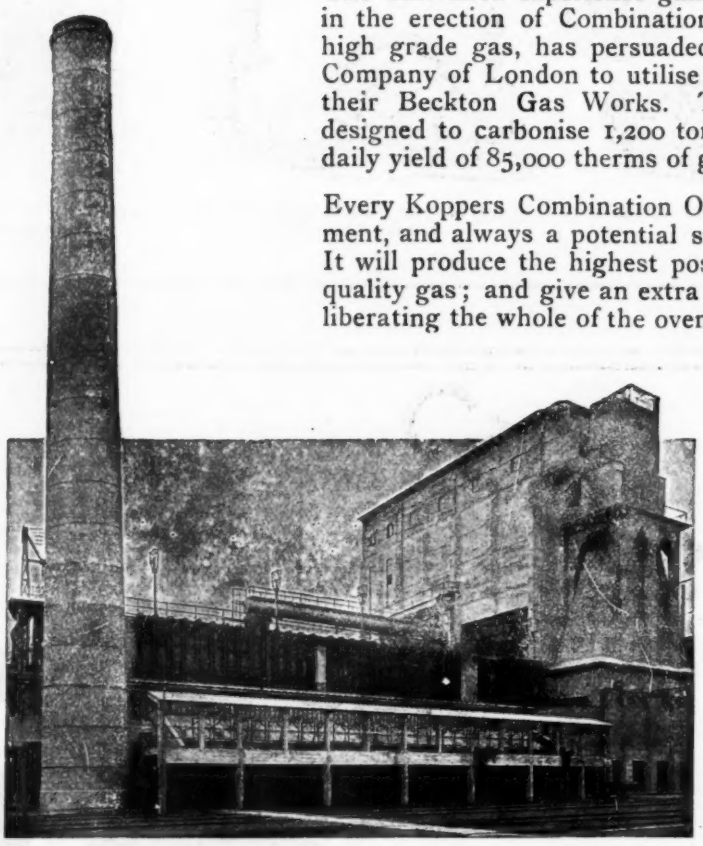

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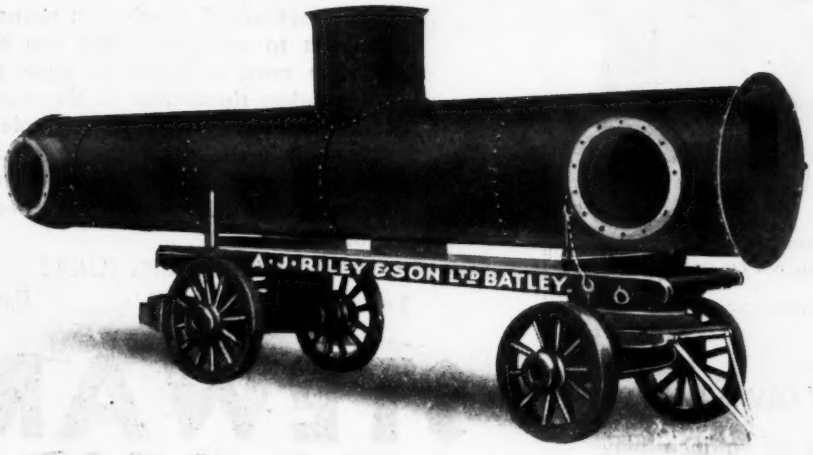

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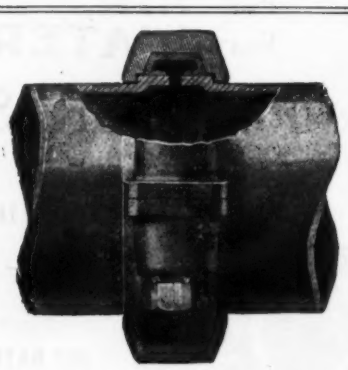

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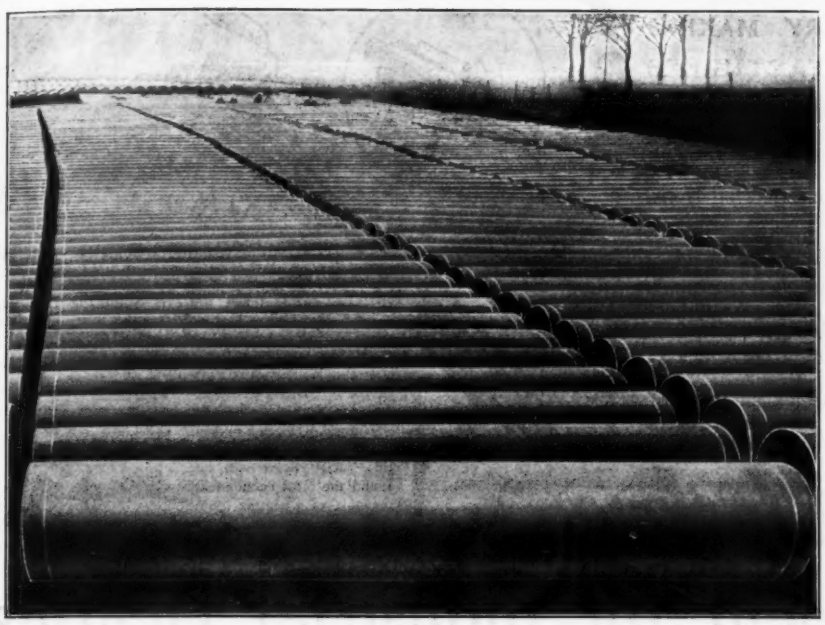

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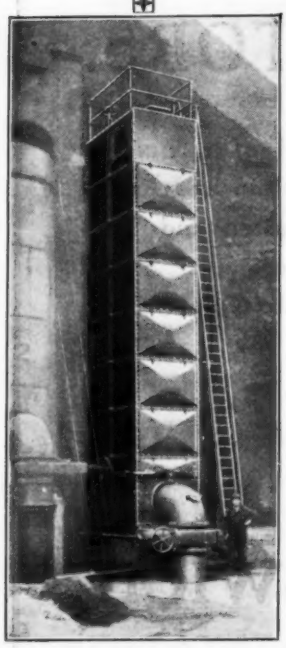

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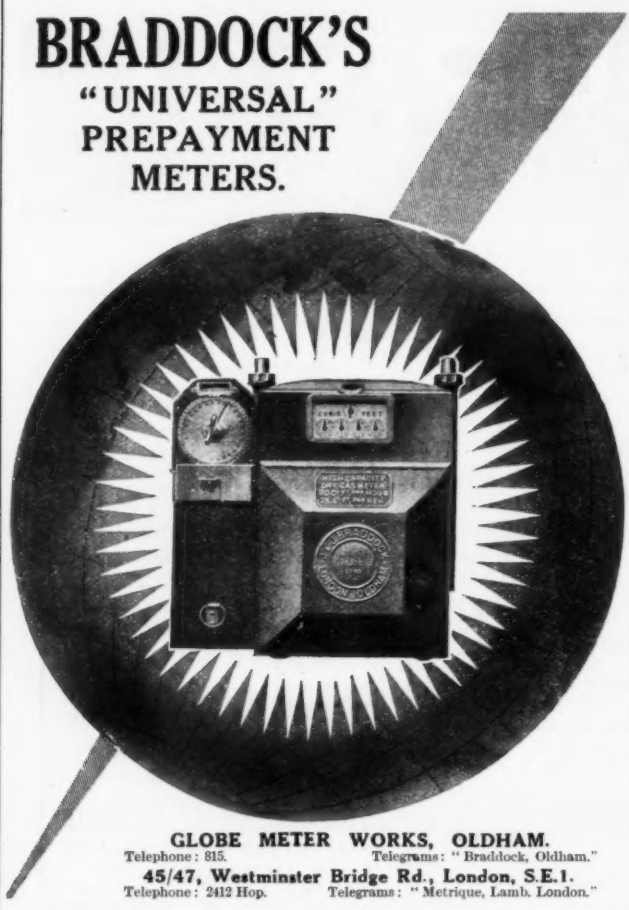

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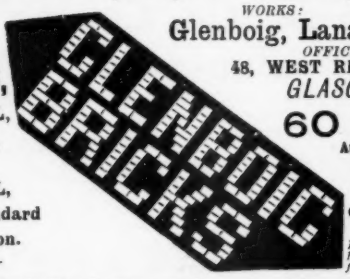

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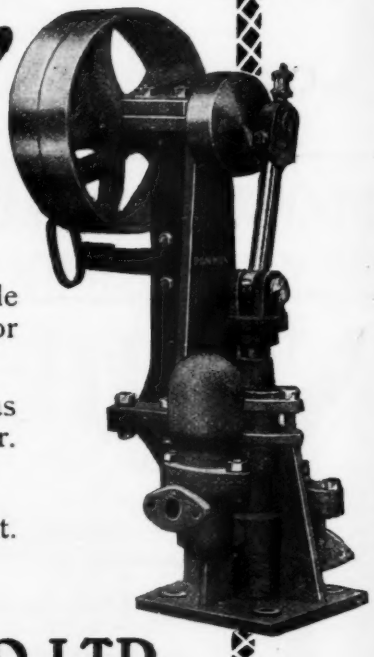

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